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SHUTTLE ACTIVE THERMAL CONTROL SYSTEM
DEVELOPMENT TESTING

VOLUME IV

BOOK 1

MODULAR RADIATOR SYSTEM TEST DATA

23 OCTOBER 1973

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CONTROL SYSTEM DEVELOPMENT TESTING.

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DEVELOPMENT TESTING

VOLUME IV
BOOK 1
MODULAR RADIATOR SYSTEM TEST DATA

Report No. T169-28

23 October 1973

Submitted by

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FOREWORD

This volume is one of a series of reports describing the development tests conducted on a candidate Shuttle heat rejection system at the National Aeronautics and Space Administration - Johnson Space Center during the period from March to July 1973. The complete test series are reported in the following volumes:

- Volume I Overall Summary
- Volume II Modular Radiator System Tests
- Volume III Modular Radiator System Test Data
Correlation With Thermal Model
- Volume IV Modular Radiator System Test Data
- Volume V Integrated Radiator/Expendable Cooling System
Tests
- Volume VI Water Ejector Plume Tests
- Volume VII Improved Radiator Coating Adhesives Tests
- Volume VIII Tube Anomaly Investigation

The tests were conducted jointly by NASA and the Vought Systems Division of LTV Aerospace Corporation under Contract NAS9-10534. D. W. Morris of the NASA-JSC Crew Systems Division was the contract technical monitor. Mr. R. J. Tufte served as the VSD Project Engineer.

TABLE OF CONTENTS

| | | <u>PAGE</u> |
|-----|------------------------------------|-------------|
| 1.0 | SUMMARY AND INTRODUCTION | 1 |
| 2.0 | TEST DATA PRESENTATION | 2 |

LIST OF FIGURES

| | | |
|---|--|----|
| 1 | MRS Test Instrumentation | 13 |
| 2 | Panel Thermocouple Locations | 14 |

LIST OF TABLES

| | | |
|---|---|----|
| 1 | Test Timeline | 4 |
| 2 | Test Point Grouping | 6 |
| 3 | Plotted Flow and Pressure Measurements | 7 |
| 4 | Plotted System and Panel Inlet and Outlet Temperatures. | 8 |
| 5 | Organization of On-Panel Temperature Data | 10 |
| 6 | Flow Meter Ranges | 11 |
| 7 | Plotted Data Resolution | 12 |

1.0 SUMMARY AND INTRODUCTION

A three-week test of a Modular Radiator System (MRS) was conducted in the Space Environment Simulation Laboratory (SESL) at the Johnson Space Center (JSC) during the time period March 5 through 23, 1973.

This volume presents plots of all key data recorded during the three-week test.

2.0 TEST DATA PRESENTATION

Table 1 presents the test time line in the order that the tests were run. A complete definition of each test point is given in Volume II of this report. The MRS test data presented herein, is grouped into chronological periods as shown in Table 2. Each group is further subdivided by type of measurement as shown below:

- o Flowrates and pressure drop measurements - See Fig. 1 and Table 3.
- o System and panel inlet and outlet temperatures - See Fig. 1 and Table 4.
- o On-panel temperatures - See Fig. 2 and Table 5

The desired test data is found by first entering Table 2 to determine the alphabetical grouping, then using the index presented in Tables 3, 4, and 5 to find the appropriate page numbers within the group.

Accurate system and individual panel inlet and outlet temperatures are considered imperative in determining the radiator system performance. In order to improve the measurement accuracy, two ranges of thermocouples were used for this data (see Table 4). The AI0001 through AI0036 series have a temperature range of -300°F to -40°F and the AJ0001 through AJ0036 series have a temperature range of -60°F to +200°F. Data plots are presented for both the AI and AJ series even when all data is off scale for one series.

During the third week of testing it was observed that the inlets to the prime tubes inside the chamber were reading approximately 9°F higher than the prime inlet outside the chamber. With chamber cold walls it did not seem reasonable that a net heat gain of this magnitude could occur. Starting with day 79 approximately 2230 hours the back-up thermocouples for AI0003 through AI0036 were recorded on the miscellaneous channels, MS0003 through MS0036. The MS data agreed well with the measurements outside the chamber. Subsequent to the test it was discovered that a dissimilar thermocouple connector inside the chamber was used for AI0003 through AI0014. During the first two weeks of testing the chamber walls were warm and the thermocouple connector did not affect the readings. However, during the third week the chamber walls were cold and a temperature gradient in the connector produced an EMF which affected the readings. A survey of the AI and MS readings after 2230 on day 79 indicated that the AI readings averaged 8.5°F high. This value

should be subtracted from all A10003 through A10014 data between day 78, 0735 hours and day 80, 0100. Subsequent to this time the MS data is plotted in place of the AI data and values can be read directly from the plots.

As indicated on Figure 1, two or three flowmeters of different ranges were used for each of the flow measurements. Table 6 shows the range for each flowmeter. The flowmeters were manually valved in or out to obtain the correct meter as the flow changed. The data plots include the flowmeter readings even if it is off line or out of range. On day 71, 1540 hours the transducer on FM54 failed during a recovery transient. The FM56 transducer was not in use for this test sequence so it was switched to FM-54. Therefore FM-54 data is recorded on FM-56 channel during this period.

The resolution of the plotted data is shown on Table 7. Resolution is defined as the band between one plot mark and the next one. This table indicates that the plotted data will indicate no change until the measured value change is greater than the resolution value. For example, all AJ temperature measurements will plot as a constant value until the measured temperature changes by 6°F.

TABLE I
THREE WEEK TEST TIMELINE

| <u>DATE</u> | <u>DAY</u> | <u>TEST POINT</u> | <u>BEGIN</u> | <u>END</u> |
|---------------|------------|-------------------|--------------|--------------|
| 5 March 1973 | 64 | 1 | 1525 | 1855 |
| | | 1A | 1855 | 2020 |
| | | 2 | 2020 | 0146(day 65) |
| 6 March 1973 | 65 | 3 | 0146 | 0445 |
| | | 4 | 0445 | 0600 |
| | | Chamber Down | 0948 | 1700 |
| | | 5 | 1700 | 1920 |
| 7 March 1973 | 66 | 8 | 0020 | 0430 |
| 8 March 1973 | 67 | 10 | 0430 | 0755 |
| | | 12 | 0755 | 1115 |
| | | 17 | 1115 | 1525 |
| | | 17A | 2050 | 2256 |
| | | 18 | 2300 | 0340(day 68) |
| | | 19 | 0740 | 1140 |
| | | 47 | 1108 | 2025 |
| 9 March 1973 | 68 | 14 | 0000 | 0315 |
| 12 March 1973 | 71 | 14A | 0315 | 0615 |
| 13 March 1973 | 72 | 16 | 0730 | 1040 |
| | | 20 | 1040 | 1515 |
| | | 11 | 1515 | 1830 |
| | | Chamber Down | 1830 | 1400(day 73) |
| | | 31 | 1400 | 1525 |
| | | 32 | 1525 | 1825 |
| 14 March 1973 | 73 | 33 | 1825 | 1920 |
| | | 48 | 1920 | 2210 |
| | | 49 | 2210 | 2330 |
| | | 37 | 2330 | 0210(day 74) |
| | | 38 | 0210 | 0300 |
| | | 39 | 0300 | 0400 |
| | | 45 | 0400 | 0615 |
| 15 March 1973 | 74 | 46 | 0615 | 0745 |

TABLE I (CONT'D)

| <u>DATE</u> | <u>DAY</u> | <u>TEST POINT</u> | <u>BEGIN</u> | <u>END</u> |
|---------------|------------|-------------------|--------------|--------------|
| 15 March 1973 | 74 | 50 | 0745 | 1900 |
| | | 43 | 1900 | 2335 |
| | | 36 | 2335 | 0600(day 75) |
| 16 March 1973 | 75 | 36A | 0600 | 0955 |
| 19 March 1973 | 78 | 21 | 0736 | 1000 |
| | | 22 | 1000 | 1340 |
| | | 23 | 1340 | 1720 |
| | | 24 | 1720 | 2025 |
| | | 25 | 2025 | 2330 |
| | | 26 | 2330 | 0130(day 79) |
| | | 27 | 0130 | 0250 |
| 20 March 1973 | 79 | 28 | 0250 | 0525 |
| | | 29 | 0525 | 1110 |
| | | 62 | 1110 | 0045 |
| | | 57 | 0045 | 0420 |
| 21 March 1973 | 80 | 58 | 0420 | 0735 |
| | | 60 | 0735 | 1140 |
| | | 51 | 1646 | 1735 |
| | | 52 | 1735 | 1920 |
| | | 52A | 1920 | 2031 |
| | | 52B | 2031 | 2105 |
| | | 52C | 2105 | 2200 |
| | | 52D | 2200 | 2336 |
| | | 52E | 2336 | 0205(day 81) |
| | | 53A | 0205 | 0605 |
| 22 March 1973 | 81 | 53 | 0605 | 0715 |
| | | 54 | 0715 | 0825 |
| | | 55 | 0825 | 9:20 |
| | | 56 | 0920 | 1105 |
| | | 59 | 1105 | 1210 |
| | | 63 | 1800 | 2144 |
| | | 64 | 2300 | 0200(day 82) |
| 23 March 1973 | 82 | 61 | 0200 | 0630 |

TABLE 2

TEST POINT GROUPING

| GROUP | TEST TIMES (day, hour) | | TEST POINTS |
|-------|------------------------|-----------|--------------------------------|
| | FROM | TO | |
| A | 64 - 1525 | 65 - 0600 | 1, 1A, 2, 3, 4 |
| B | 66 - 1700 | 67 - 1525 | 5, 8, 10, 12, 17 |
| C | 67 - 1525 | 68 - 1140 | 17A, 18, 19 |
| D | 71 - 1108 | 72 - 0315 | 47, 14 |
| E | 72 - 0315 | 72 - 1830 | 15(144), 16, 20, 11 |
| F | 73 - 1400 | 74 - 0400 | 31, 32, 33, 48, 49, 37, 38, 39 |
| G | 74 - 0400 | 74 - 2335 | 45, 46, 50, 43 |
| H | 74 - 2335 | 75 - 0955 | 36, 36A |
| I | 78 - 0736 | 79 - 0130 | 21, 22, 23, 24, 25, 26 |
| J | 79 - 0130 | 80 - 0110 | 27, 28, 29 |
| K | 80 - 0110 | 80 - 1735 | 57, 58, 60, 51 |
| L | 80 - 1735 | 81 - 1105 | 52, 53, 54, 55, 56 |
| M | 81 - 1105 | 82 - 0630 | 59, 63, 64, 61 |

TABLE 3

PLOTTED FLOW AND PRESSURE MEASUREMENTS

| PAGE | Transducer Number | Description | Units |
|------|----------------------|--------------------------------|-------|
| 1 | FM0040 | TOTAL FLOW | LBPH |
| | FM0043 | TOTAL PRIME FLOW HIGH RANGE | LBPH |
| | FM0046 | TOTAL BANK FLOW HIGH RANGE | LBPH |
| 2 | FM0041 | TOTAL PRIME FLOW LOW RANGE | LBPH |
| | FM0044 | TOTAL BANK FLOW LOW RANGE | LBPH |
| | FM0047 | PRIME CKT 1 AND 2 LOW RANGE | LBPH |
| | FM0050 | PRIME CKT 3 AND 4 LOW RANGE | LBPH |
| 3 | FM0042 | TOTAL PRIME FLOW INT RANGE | LBPH |
| | FM0045 | TOTAL BANK FLOW INT RANGE | LBPH |
| | FM0048 | PRIME CKT 1 AND 2 INT RANGE | LBPH |
| | FM0051 | PRIME CKT 3 AND 4 INT RANGE | LBPH |
| 4 | FM0049 | PRIME CKT 1 AND 2 HIGH RANGE | LBPH |
| | FM0052 | PRIME CKT 3 AND 4 HIGH RANGE | LBPH |
| 5 | FM0053 | BANK CKT 5 INT RANGE | LBPH |
| | FM0055 | BANK CKT 6 INT RANGE | LBPH |
| | FM0057 | BANK CKT 7 INT RANGE | LBPH |
| | FM0059 | BANK CKT 8 INT RANGE | LBPH |
| 6 | FM0054 | BANK CKT 5 HIGH RANGE | LBPH |
| | FM0056 | BANK CKT 6 HIGH RANGE | LBPH |
| | FM0058 | BANK CKT 7 HIGH RANGE | LBPH |
| | FM0060 | BANK CKT 8 HIGH RANGE | LBPH |
| 7 | PK0066 | BANK PANEL 1 DELTA PRESSURE | PSID |
| | PK0067 | BANK PANEL 2 DELTA PRESSURE | PSID |
| | PK0068 | BANK PANEL 3 DELTA PRESSURE | PSID |
| | PK0069 | BANK PANEL 4 DELTA PRESSURE | PSID |
| 8 | PK0065 | PRIME TUBE MIX OUTLET PRESSURE | PSIG |
| 9 | PK0061 | PRIME CKT 1 INLET PRESSURE | PSIG |
| | PK0062 | PRIME CKT 2 INLET PRESSURE | PSIG |
| | PK0063 | PRIME CKT 3 INLET PRESSURE | PSIG |
| | PK0064 | PRIME CKT 4 INLET PRESSURE | PSIG |
| 10 | PK0070 | BANK PANEL 5 DELTA PRESSURE | PSID |
| | PK0071 | BANK PANEL 6 DELTA PRESSURE | PSID |
| | PK0072 | BANK PANEL 7 DELTA PRESSURE | PSID |

TABLE 4

PLOTTED SYSTEM AND PANEL INLET AND OUTLET TEMPERATURES

| PAGE | T/C No | Description | Units |
|------|--------|------------------------------|-------|
| 11 | AI0001 | PRIME SYSTEM INLET | DEG F |
| 12 | AI0002 | BANK SYSTEM INLET | DEG F |
| 13 | AJ0001 | PRIME SYSTEM INLET | DEG F |
| 14 | AJ0002 | BANK SYSTEM INLET | DEG F |
| 15 | AI0019 | PRIME TUBES OUTLET MIX IN CH | DEG F |
| | AI0036 | BANK TUBES OUTLET MIX IN CH | DEG F |
| | AI0039 | MIXED BANK AND PRIME | DEG F |
| 16 | AJ0019 | PRIME TUBES OUTLET MIX IN CH | DEG F |
| | AJ0036 | BANK TUBES OUTLET MIX IN CH | DEG F |
| | AJ0039 | MIXED BANK AND PRIME | DEG F |
| 17 | AI0003 | PANEL NO 1 PRIME TUBE INLET | DEG F |
| | AI0004 | PANEL NO 2 PRIME TUBE INLET | DEG F |
| | AI0005 | PANEL NO 5 PRIME TUBE INLET | DEG F |
| | AI0006 | PANEL NO 6 PRIME TUBE INLET | DEG F |
| 18 | AJ0003 | PANEL NO 1 PRIME TUBE INLET | DEG F |
| | AJ0004 | PANEL NO 2 PRIME TUBE INLET | DEG F |
| | AJ0005 | PANEL NO 5 PRIME TUBE INLET | DEG F |
| | AJ0006 | PANEL NO 6 PRIME TUBE INLET | DEG F |
| 19 | AI0007 | PANEL NO 1 PRIME TUBE OUTLET | DEG F |
| | AI0008 | PANEL NO 2 PRIME TUBE OUTLET | DEG F |
| | AI0009 | PANEL NO 5 PRIME TUBE OUTLET | DEG F |
| | AI0010 | PANEL NO 6 PRIME TUBE OUTLET | DEG F |
| 20 | AJ0007 | PANEL NO 1 PRIME TUBE OUTLET | DEG F |
| | AJ0008 | PANEL NO 2 PRIME TUBE OUTLET | DEG F |
| | AJ0009 | PANEL NO 5 PRIME TUBE OUTLET | DEG F |
| | AJ0010 | PANEL NO 6 PRIME TUBE OUTLET | DEG F |
| 21 | AI0011 | PANEL NO 3 PRIME TUBE INLET | DEG F |
| | AI0012 | PANEL NO 4 PRIME TUBE INLET | DEG F |
| | AI0013 | PANEL NO 7 PRIME TUBE INLET | DEG F |
| | AI0014 | PANEL NO 8 PRIME TUBE INLET | DEG F |
| 22 | AJ0011 | PANEL NO 3 PRIME TUBE INLET | DEG F |
| | AJ0012 | PANEL NO 4 PRIME TUBE INLET | DEG F |
| | AJ0013 | PANEL NO 7 PRIME TUBE INLET | DEG F |
| | AJ0014 | PANEL NO 8 PRIME TUBE INLET | DEG F |
| 23 | AI0015 | PANEL NO 3 PRIME TUBE OUTLET | DEG F |
| | AI0016 | PANEL NO 4 PRIME TUBE OUTLET | DEG F |
| | AI0017 | PANEL NO 7 PRIME TUBE OUTLET | DEG F |
| | AI0018 | PANEL NO 8 PRIME TUBE OUTLET | DEG F |
| 24 | AJ0015 | PANEL NO 3 PRIME TUBE OUTLET | DEG F |
| | AJ0016 | PANEL NO 4 PRIME TUBE OUTLET | DEG F |
| | AJ0017 | PANEL NO 7 PRIME TUBE OUTLET | DEG F |
| | AJ0018 | PANEL NO 8 PRIME TUBE OUTLET | DEG F |
| 25 | AI0020 | PANEL NO 1 BANK TUBE INLET | DEG F |
| | AI0021 | PANEL NO 2 BANK TUBE INLET | DEG F |
| | AI0022 | PANEL NO 5 BANK TUBE INLET | DEG F |
| | AI0023 | PANEL NO 6 BANK TUBE INLET | DEG F |

TABLE 4 (CONTINUED)

| PAGE | T/C No. | Description | Units |
|------|---------|-----------------------------|-------|
| 26 | AJ0020 | PANEL NO 1 BANK TUBE INLET | DEG F |
| | AJ0021 | PANEL NO 2 BANK TUBE INLET | DEG F |
| | AJ0022 | PANEL NO 5 BANK TUBE INLET | DEG F |
| | AJ0023 | PANEL NO 6 BANK TUBE INLET | DEG F |
| 27 | AI0024 | PANEL NO 1 BANK TUBE OUTLET | DEG F |
| | AI0025 | PANEL NO 2 BANK TUBE OUTLET | DEG F |
| | AI0026 | PANEL NO 5 BANK TUBE OUTLET | DEG F |
| | AI0027 | PANEL NO 6 BANK TUBE OUTLET | DEG F |
| 28 | AJ0024 | PANEL NO 1 BANK TUBE OUTLET | DEG F |
| | AJ0025 | PANEL NO 2 BANK TUBE OUTLET | DEG F |
| | AJ0026 | PANEL NO 5 BANK TUBE OUTLET | DEG F |
| | AJ0027 | PANEL NO 6 BANK TUBE OUTLET | DEG F |
| 29 | AI0028 | PANEL NO 3 BANK TUBE INLET | DEG F |
| | AI0029 | PANEL NO 4 BANK TUBE INLET | DEG F |
| | AI0030 | PANEL NO 7 BANK TUBE INLET | DEG F |
| | AI0031 | PANEL NO 8 BANK TUBE INLET | DEG F |
| 30 | AJ0028 | PANEL NO 3 BANK TUBE INLET | DEG F |
| | AJ0029 | PANEL NO 4 BANK TUBE INLET | DEG F |
| | AJ0030 | PANEL NO 7 BANK TUBE INLET | DEG F |
| | AJ0031 | PANEL NO 8 BANK TUBE INLET | DEG F |
| 31 | AI0032 | PANEL NO 3 BANK TUBE OUTLET | DEG F |
| | AI0033 | PANEL NO 4 BANK TUBE OUTLET | DEG F |
| | AI0034 | PANEL NO 7 BANK TUBE OUTLET | DEG F |
| | AI0035 | PANEL NO 8 BANK TUBE OUTLET | DEG F |
| 32 | AJ0032 | PANEL NO 3 BANK TUBE OUTLET | DEG F |
| | AJ0033 | PANEL NO 4 BANK TUBE OUTLET | DEG F |
| | AJ0034 | PANEL NO 7 BANK TUBE OUTLET | DEG F |
| | AJ0035 | PANEL NO 8 BANK TUBE OUTLET | DEG F |

TABLE 5
ORGANIZATION OF ON-PANEL TEMPERATURE DATA

| DATA FROM: | IS ON THE FOLLOWING PAGES: |
|------------|----------------------------|
| Panel 1 | 33 through 46 |
| Panel 2 | 47 through 60 |
| Panel 3 | 61 through 74 |
| Panel 4 | 75 through 88 |
| Panel 5 | 89 through 102 |
| Panel 6 | 103 through 116 |
| Panel 7 | 117 through 130 |
| Panel 8 | 131 through 144 |

| EACH 14-PAGE PANEL GROUP IS ORGANIZED AS FOLLOWS | | |
|--|---------------------------------|------------------------------------|
| PAGE | T/C LOCATIONS (see Figure 2) | DESCRIPTION |
| 1st | 1,2,3,4 | Bank outlet temperatures |
| 2nd | 5,6,7,8 | Bank outlet temperatures |
| 3rd | 9,10,12,13 | Bank and prime outlet temperatures |
| 4th | 14,17,19,20 | Bank and prime inlet temperatures |
| 5th | 21,22,23,24 | Bank inlet temperatures |
| 6th | 25,26,27,28 | Bank inlet temperatures |
| 7th | 12,15,16,17 | Temperatures along 2nd tube |
| 8th | 9,30,20 | Temperatures along 4th tube |
| 9th | 5,31,36,24 | Temperatures along 8th tube |
| 10th | 3,32,37,26 | Temperatures along 10th tube |
| 11th | 1,33,34,38 | Temperatures along 12th tube |
| 12th | 30,31,32,33 | Temperatures along diagonal |
| 13th | 34,35,36 | Temperatures along median |
| 14th | 11,18,29 | Temperatures on manifold |

TABLE 6 FLOW METER RANGES

| Flow Meter | Range, LB/HR |
|---|--------------|
| FM0040 Flow Bench Total Flow | 417 to 4170 |
| FM0041 Flow Bench Prime Low Flow | 5 to 50 |
| FM0042 Flow Bench Prime Int Flow | 50 to 520 |
| FM0043 Flow Bench Prime High Flow | 417 to 4170 |
| FM0044 Flow Bench Main Low Flow | 5 to 50 |
| FM0045 Flow Bench Main Int Flow | 50 to 520 |
| FM0046 Flow Bench Main High Flow | 417 to 4170 |
| FM0047 Prime Ckt #1 & 2 Low Flow | 3.5 to 35 |
| FM0048 Prime Tube Ckt 1 & 2 Int. Flow | .17 to 175 |
| FM0049 Prime Tube Ckt #1 & 2 Hi Flow | 175 to 1750 |
| FM0050 Prime Tube Ckt #3 & 4 Low Flow | 3.3 to 35 |
| FM0051 Prime Tube Ckt #3 & 4 Int. Flow | 17 to 175 |
| FM0052 Prime Tube Ckt #3 & 4 Int. Flow | 175 to 1750 |
| FM0053 Main Tube Ckt 5 Int Flow | 17 to 175 |
| FM0054 Main Tube Ckt 5 Hi Flow | 87 to 870 |
| FM0055 Main Tube Ckt 6 Int Flow | 17 to 175 |
| FM0056 Main Tube Ckt 6 Hi Flow | 175 to 1750 |
| FM0057 Main Tube Ckt 7 Int. Flow | 17 to 175 |
| FM0058 Main Tube Ckt 7 Hi Flow | 175 to 1750 |
| FM0059 Main Tube Ckt 8 Int Flow | 17 to 175 |
| FM0060 Main Tube Ckt 8 Hi Flow | 87 to 870 |

TABLE 7 PLOTTED DATA RESOLUTION

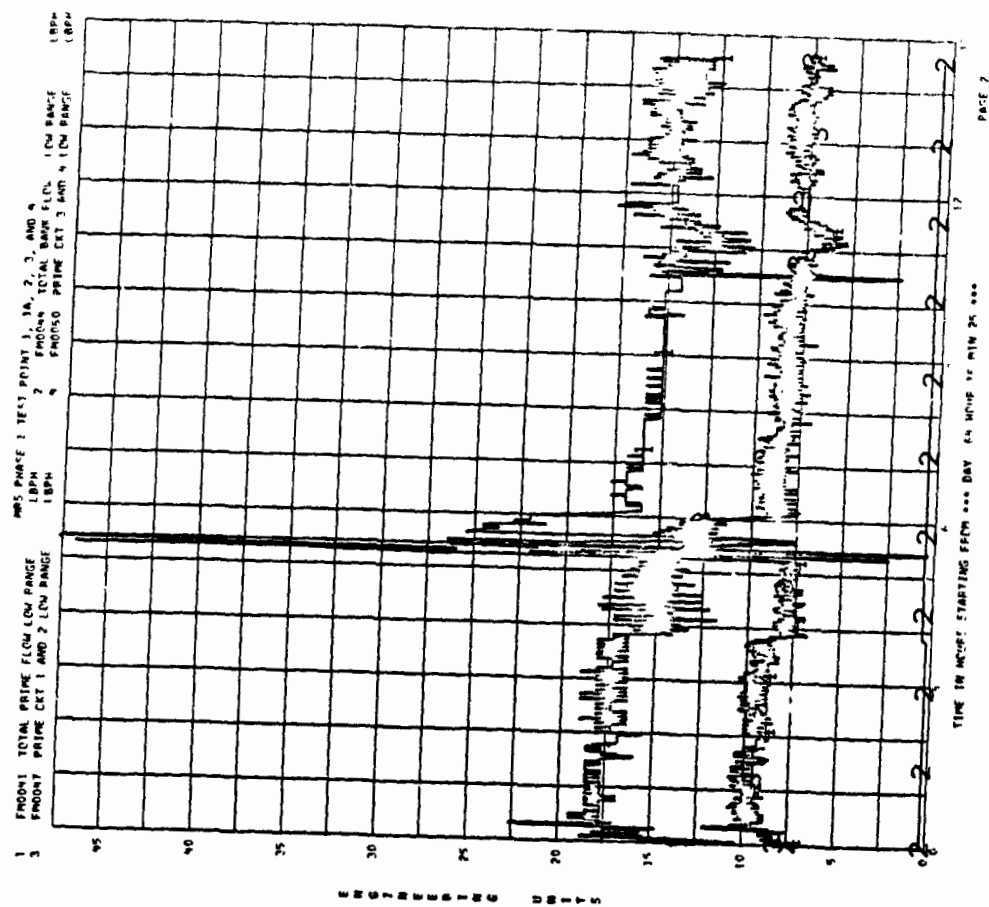
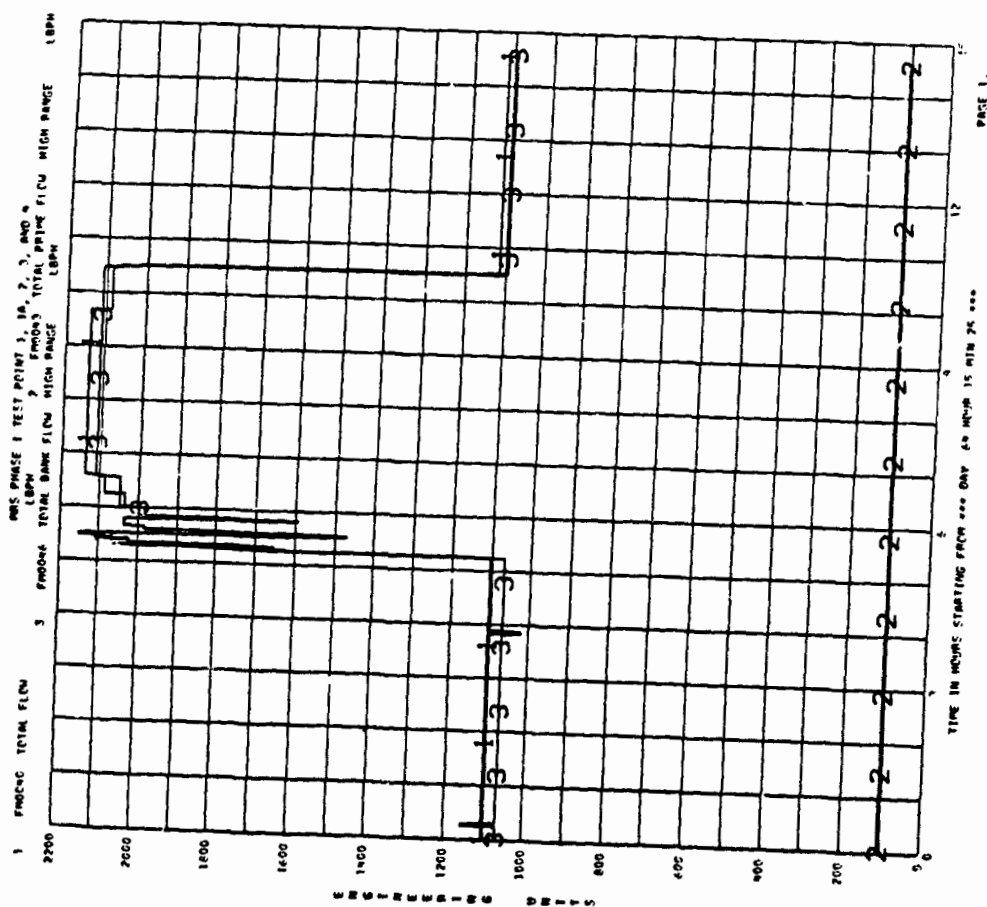
| PREFIX | NUMBERS | RANGE | APPROX. RESOLUTION |
|----------------------------|---------------------------------------|------------------|--------------------|
| AA,AB,AC,AD,AE AF,AG,AH | A11 | -300 → 200°F | 6°F |
| AI | A11 | -300 → 40°F | 4°F |
| AJ | A11 | - 60 → 200°F | 6°F |
| MS | A11 | -250 → 300°F | 6°F |
| FM | 0040, 0043, 0046 | 417 → 4170 lb/hr | 45 lb/hr |
| | 0041, 0044 | 5 → 50 lb/hr | .5 lb/hr |
| | 0042, 0045 | 50 → 520 lb/hr | 5.5 lb/hr |
| | 0047, 0050 | 3.5 → 35 lb/hr | .4 lb/hr |
| | 0048, 0051, 0053, 0055, 0057, 0059 | 17 → 175 lb/hr | 2 lb/hr |
| | 0049, 0052, 0056, 0058 | 175 → 1750 lb/hr | 18 lb/hr |
| | 0054, 0060 | 87 → 870 lb/hr | 18 lb/hr |
| PK | 0061 0065 | 0 → 500 psig | 6 psig |
| PK | 0066 0073 | 0 → 50 psig | .6 psig |

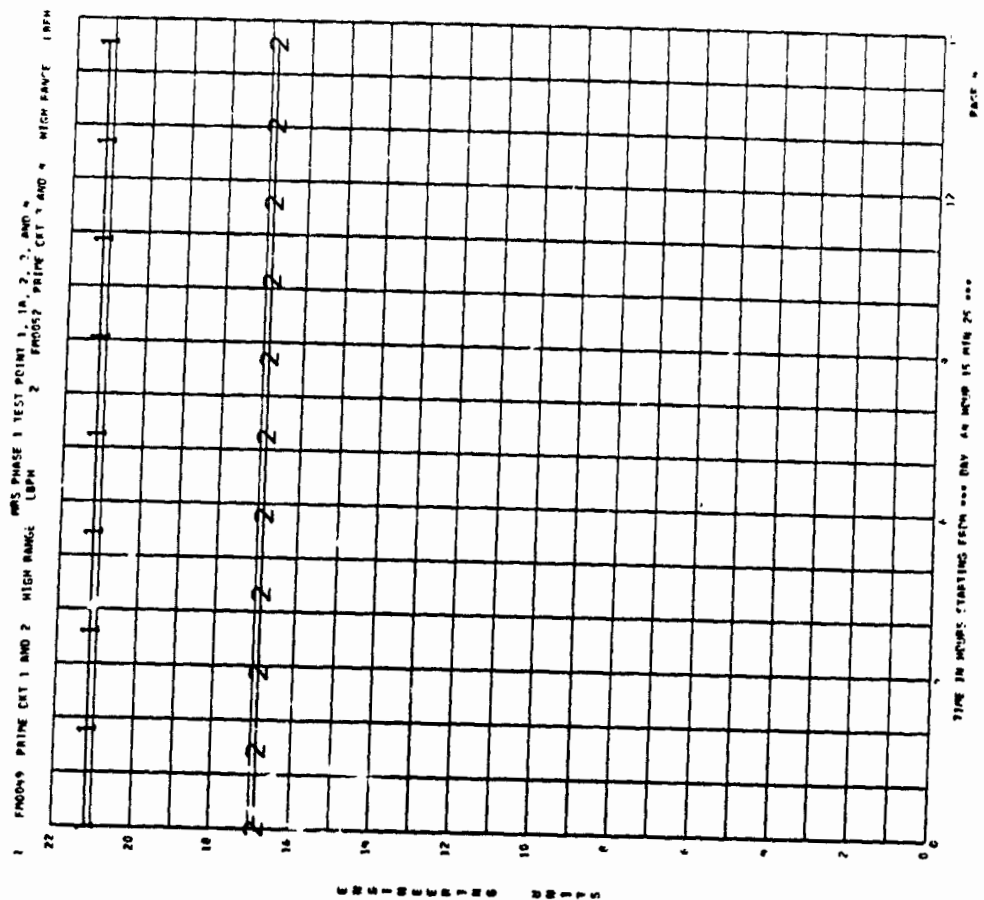
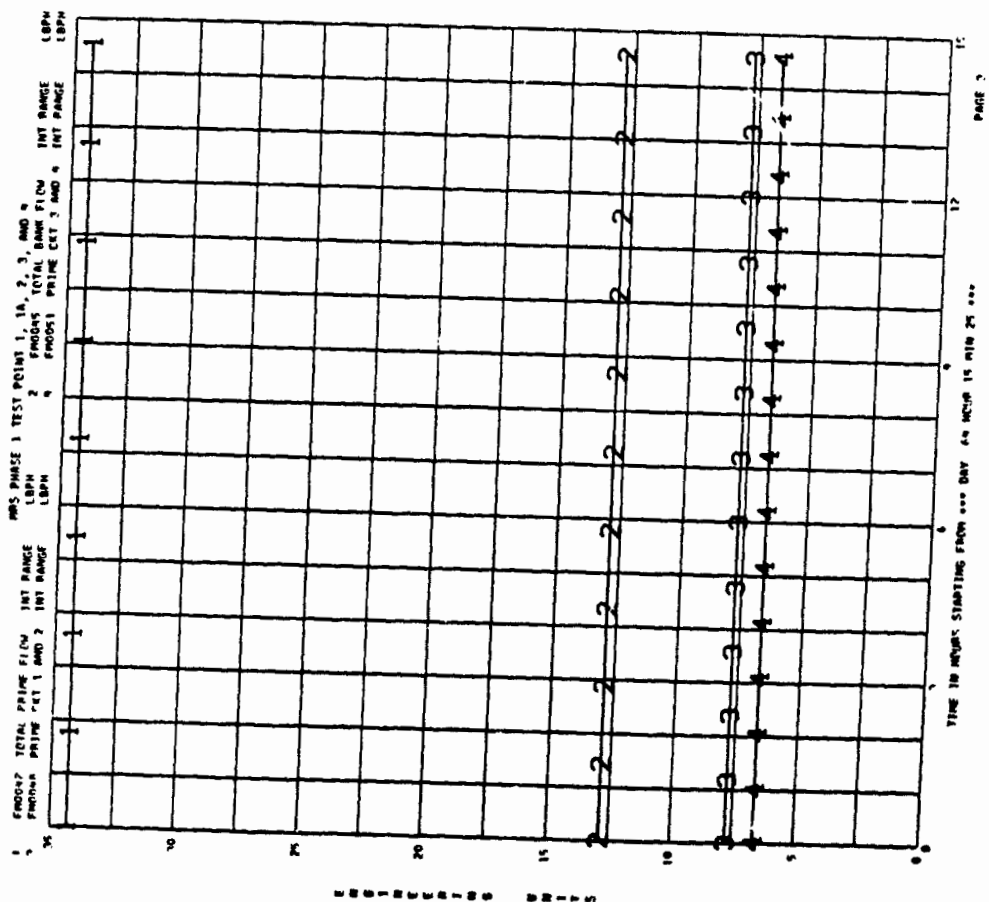
TEST GROUP A

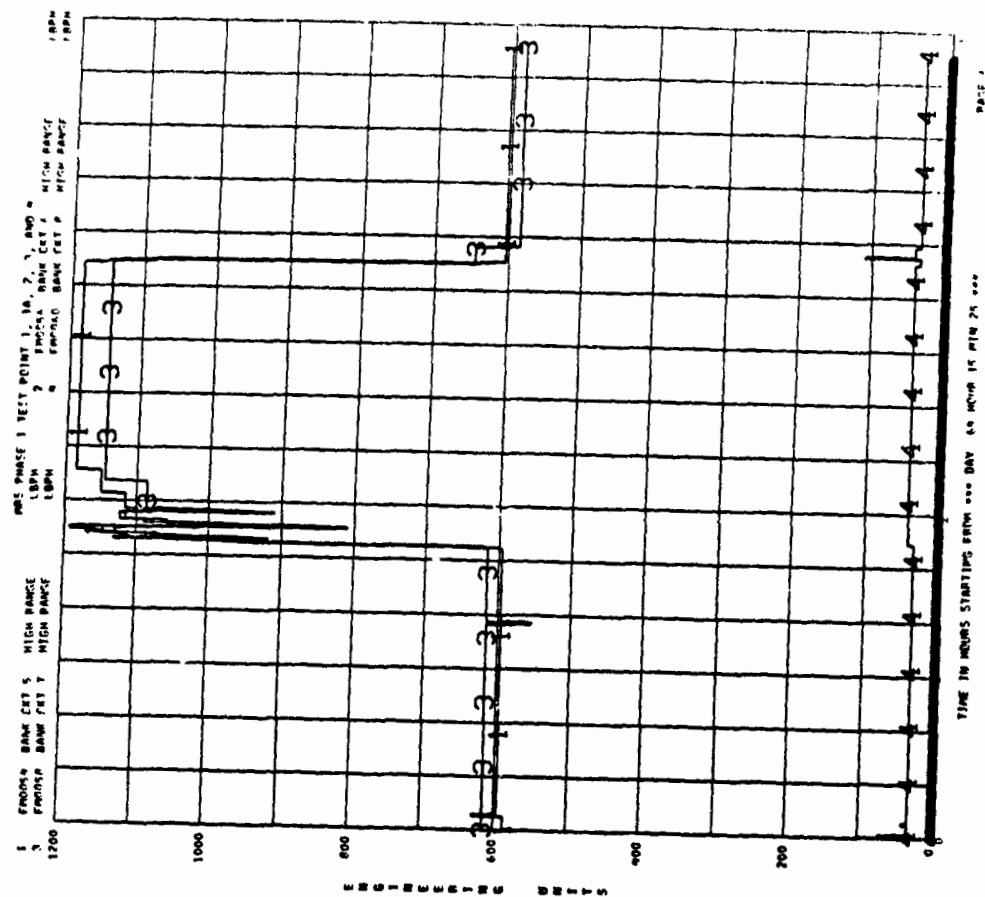
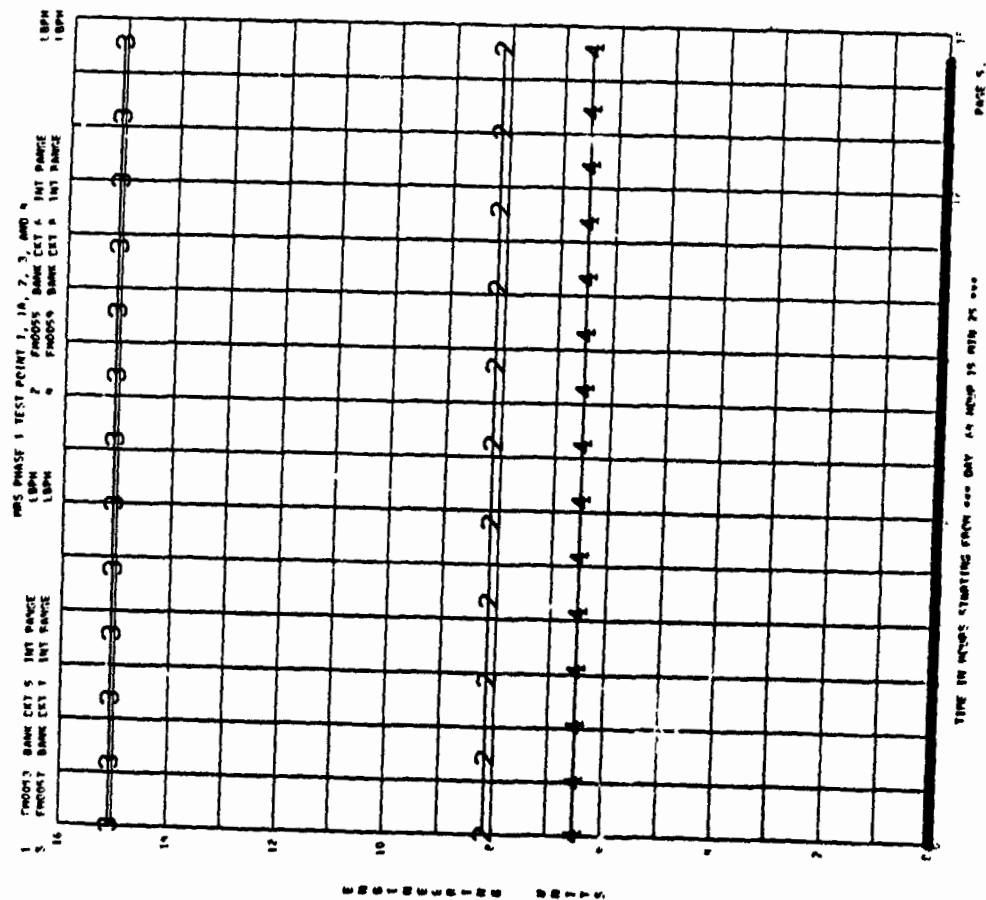
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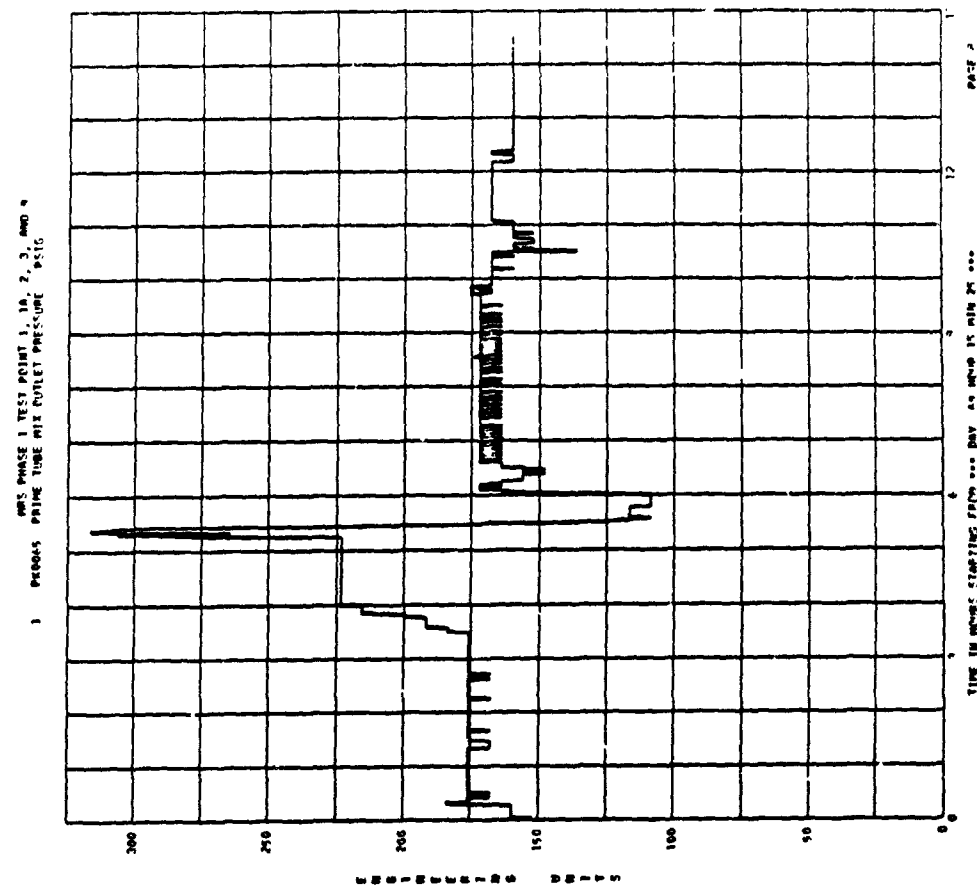
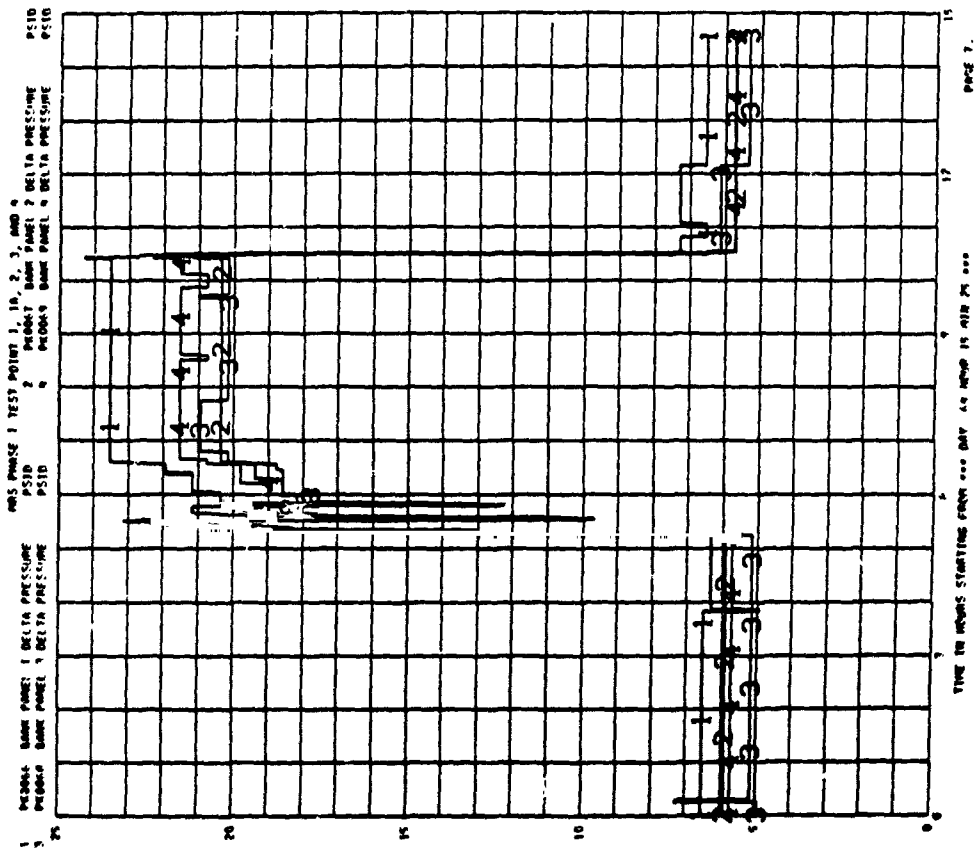
INCLUDES TEST POINTS

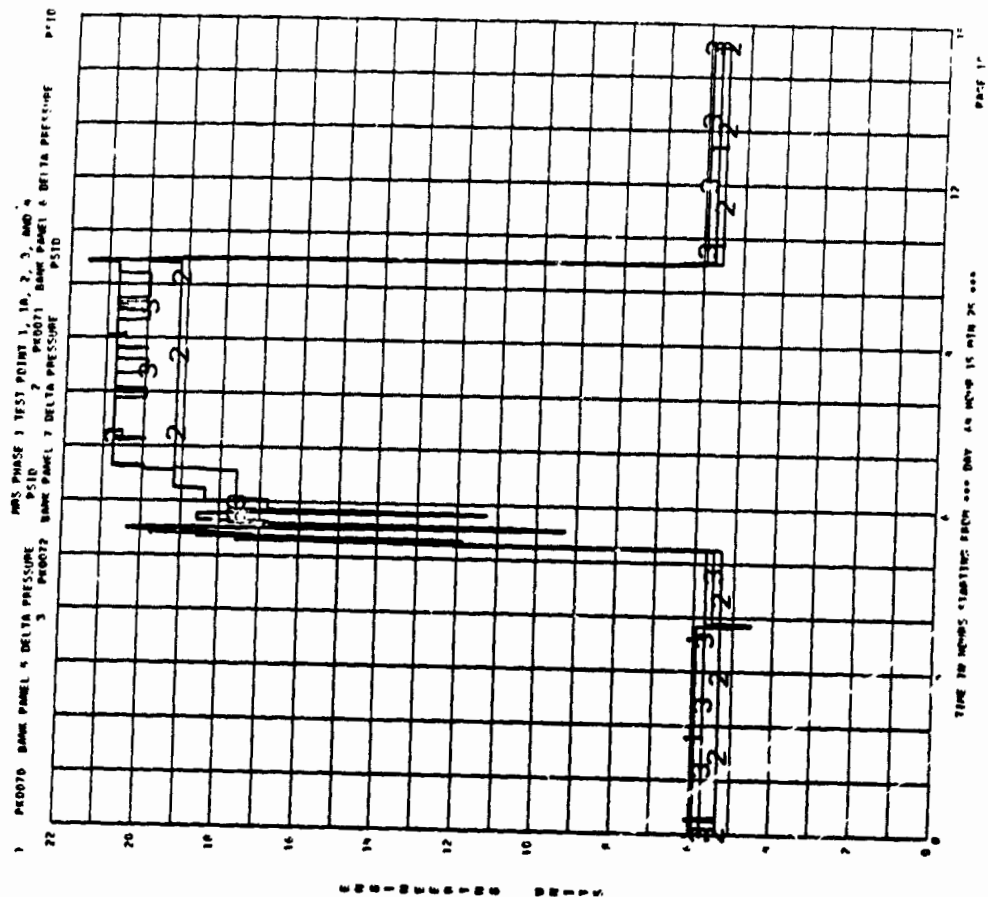
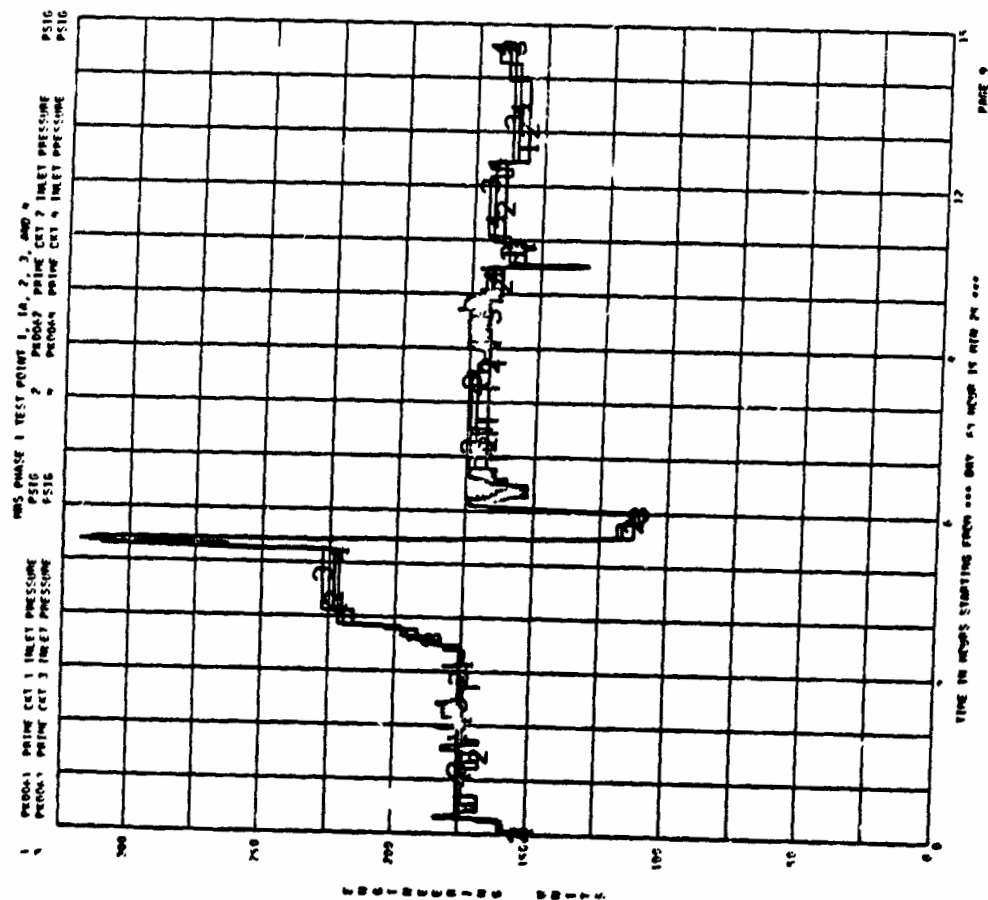
1
1A
2
3
4





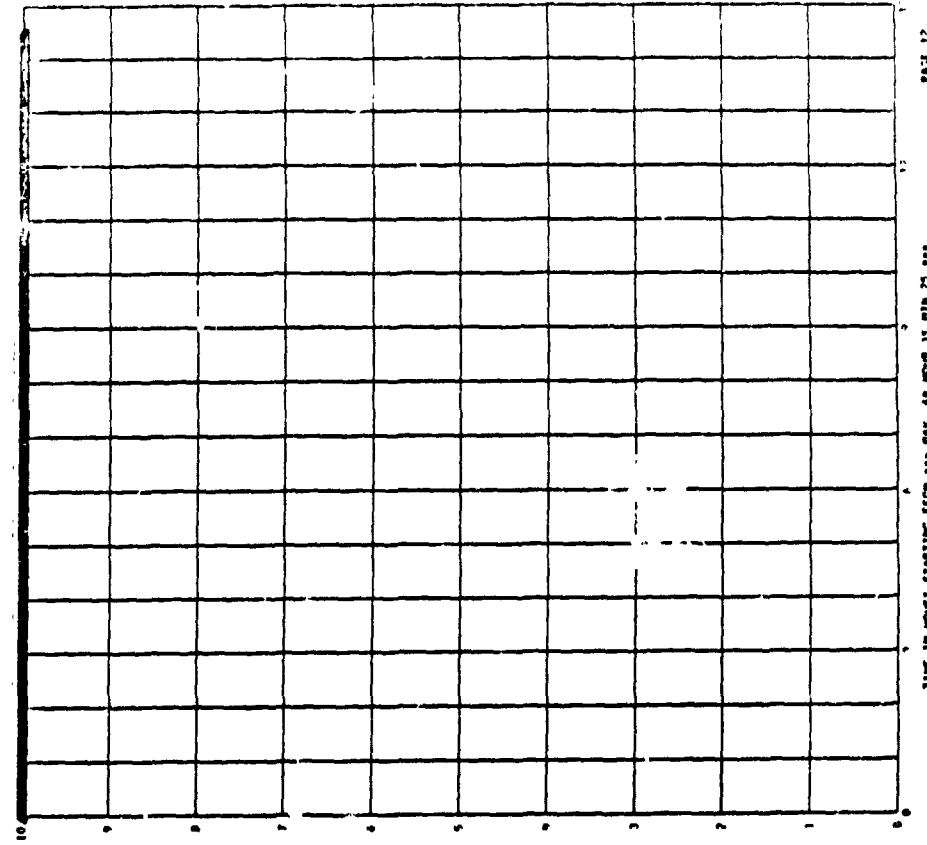
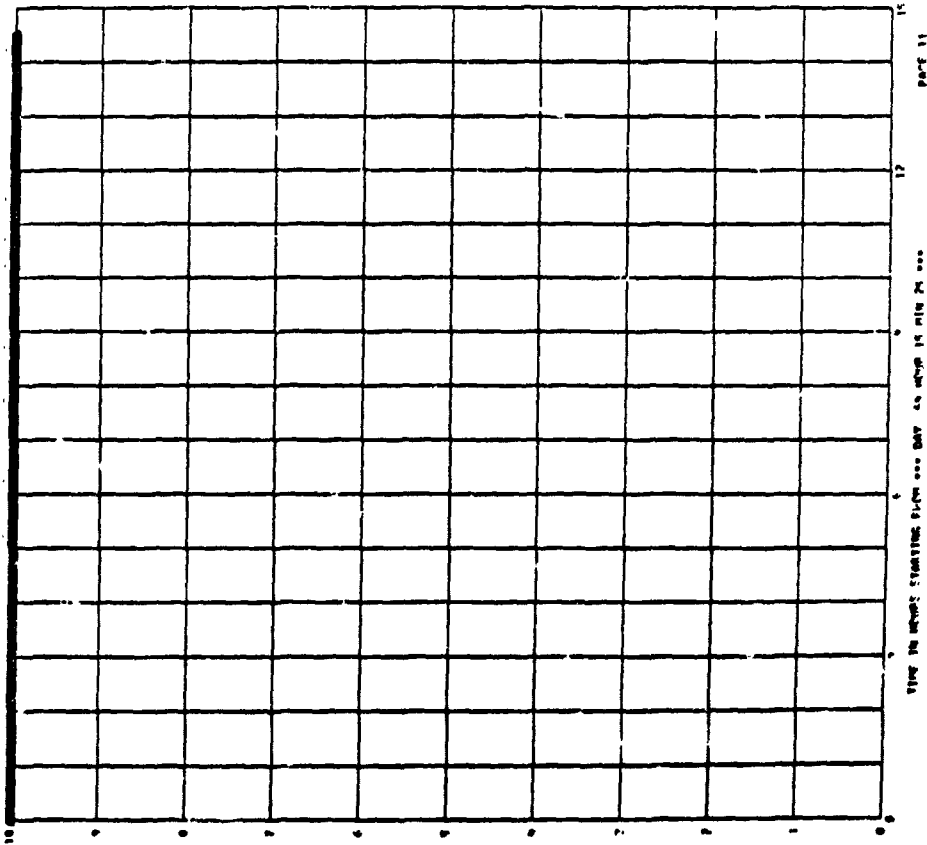




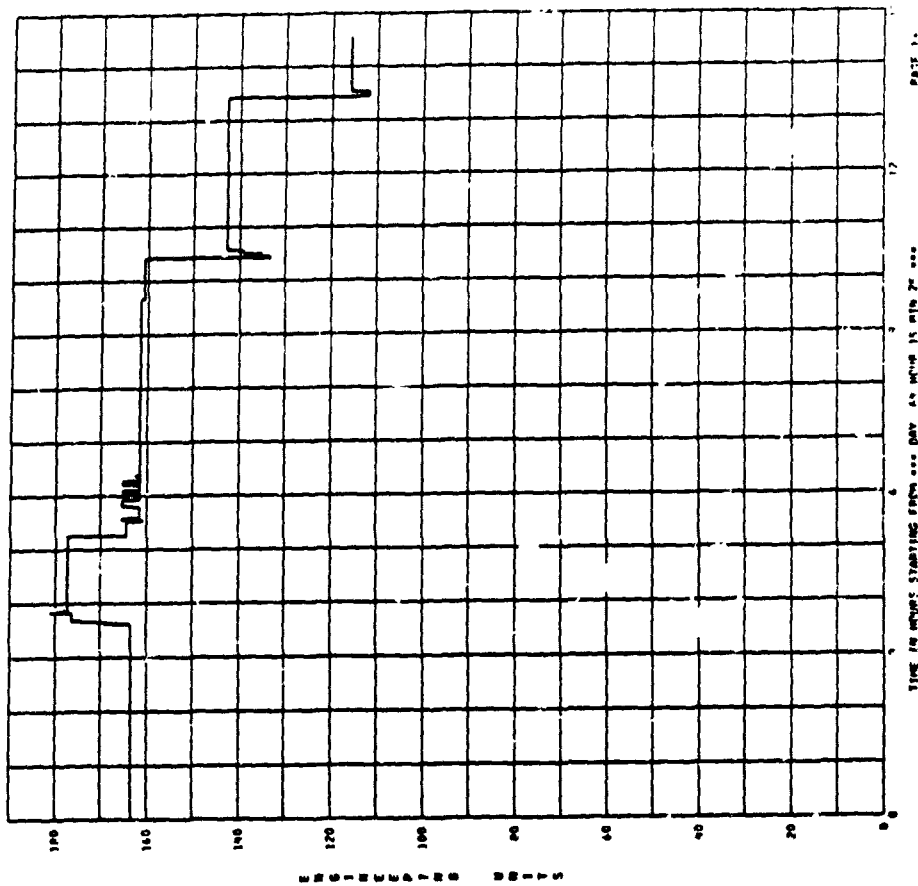


1 010001 PHASE SYSTEM INLET

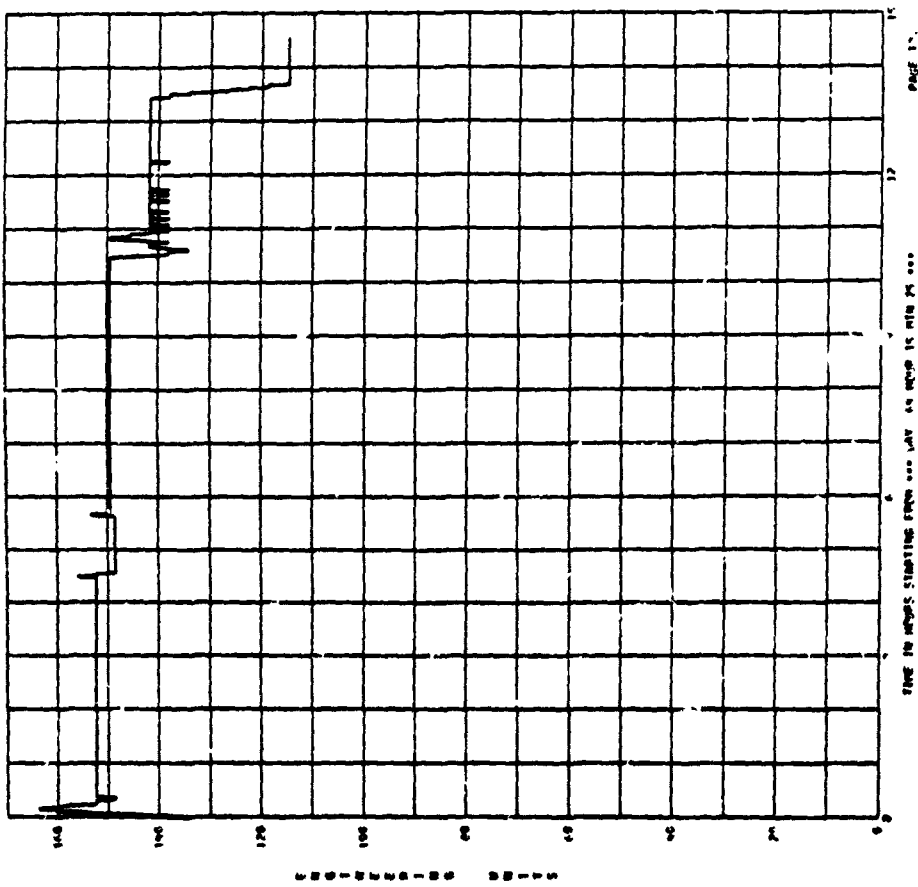
1 010002 PHASE SYSTEM INLET



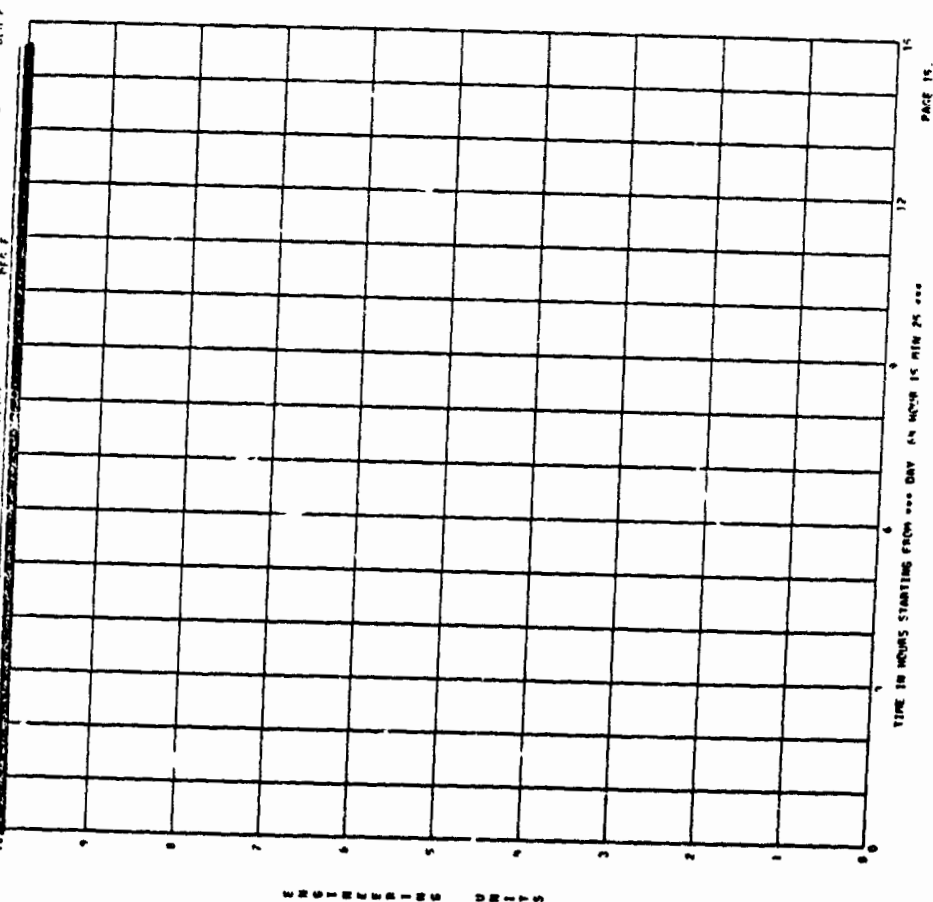
1 130002 BOMB SYSTEM INLET
 15 PHASE 1 TEST POINT 1, 1A, 2, 3, AND 4
 NEG P



1 130001 BOMB SYSTEM INLET
 15 PHASE 1 TEST POINT 1, 1A, 2, 3, AND 4
 NEG P

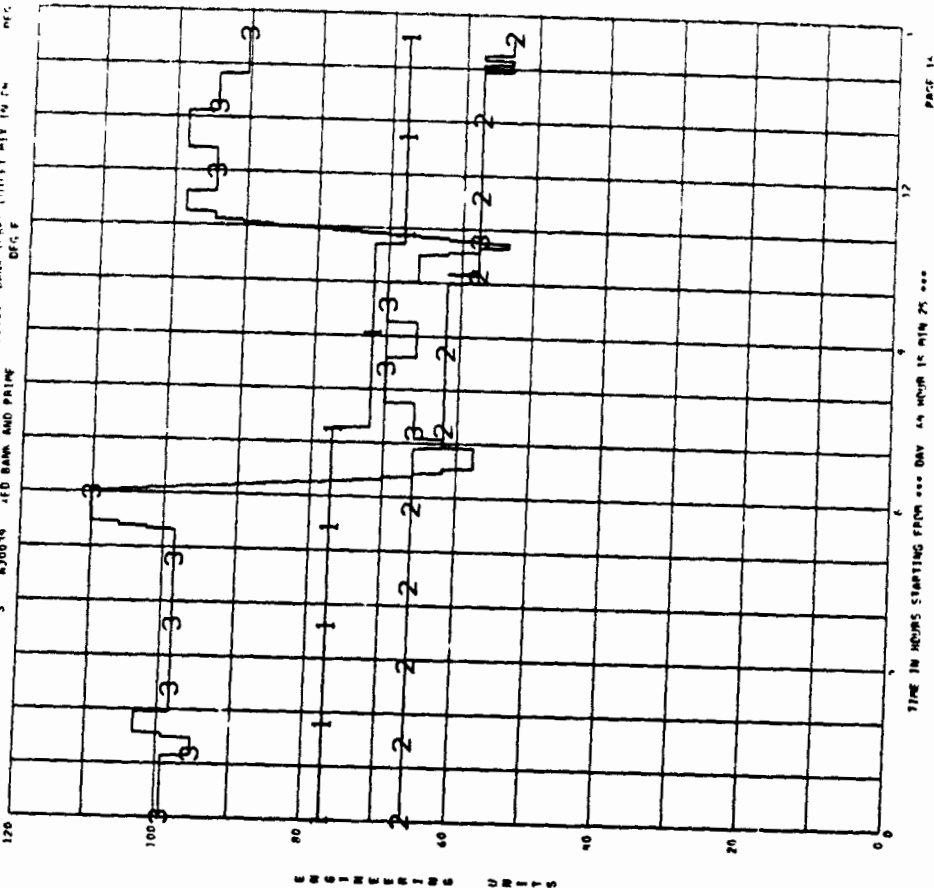


1. A10019 PRIME TUBES OUTLET MIX IN CH DEG F
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 3. A10019 PRIME TUBES OUTLET MIX IN CH DEG F
 4. A10019 PRIME TUBES OUTLET MIX IN CH DEG F
 5. A10019 PRIME TUBES OUTLET MIX IN CH DEG F
 6. A10019 PRIME TUBES OUTLET MIX IN CH DEG F
 7. A10019 PRIME TUBES OUTLET MIX IN CH DEG F
 8. A10019 PRIME TUBES OUTLET MIX IN CH DEG F
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 10. A10019 PRIME TUBES OUTLET MIX IN CH DEG F

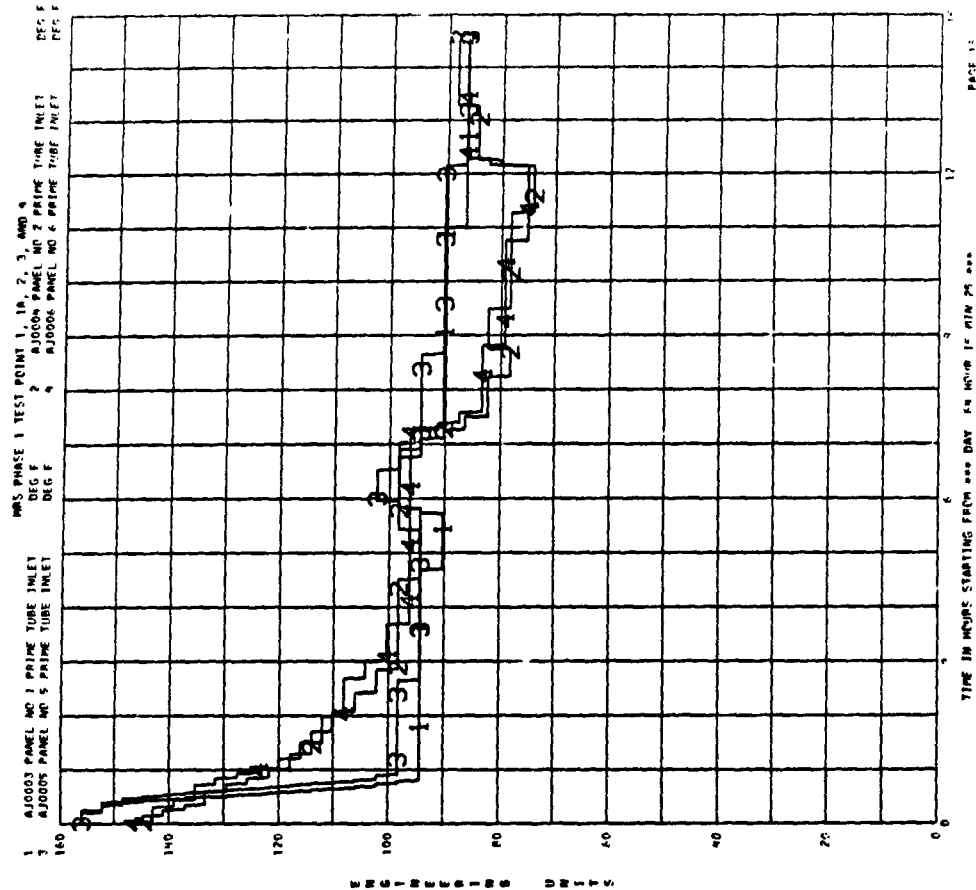
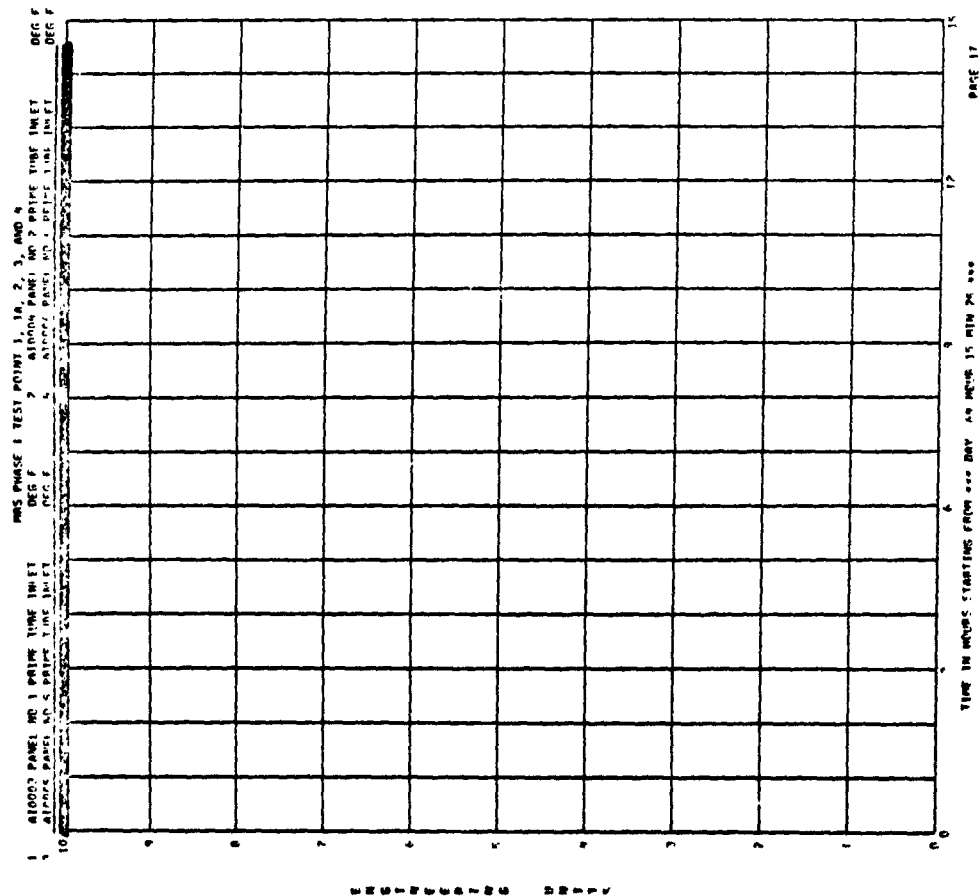


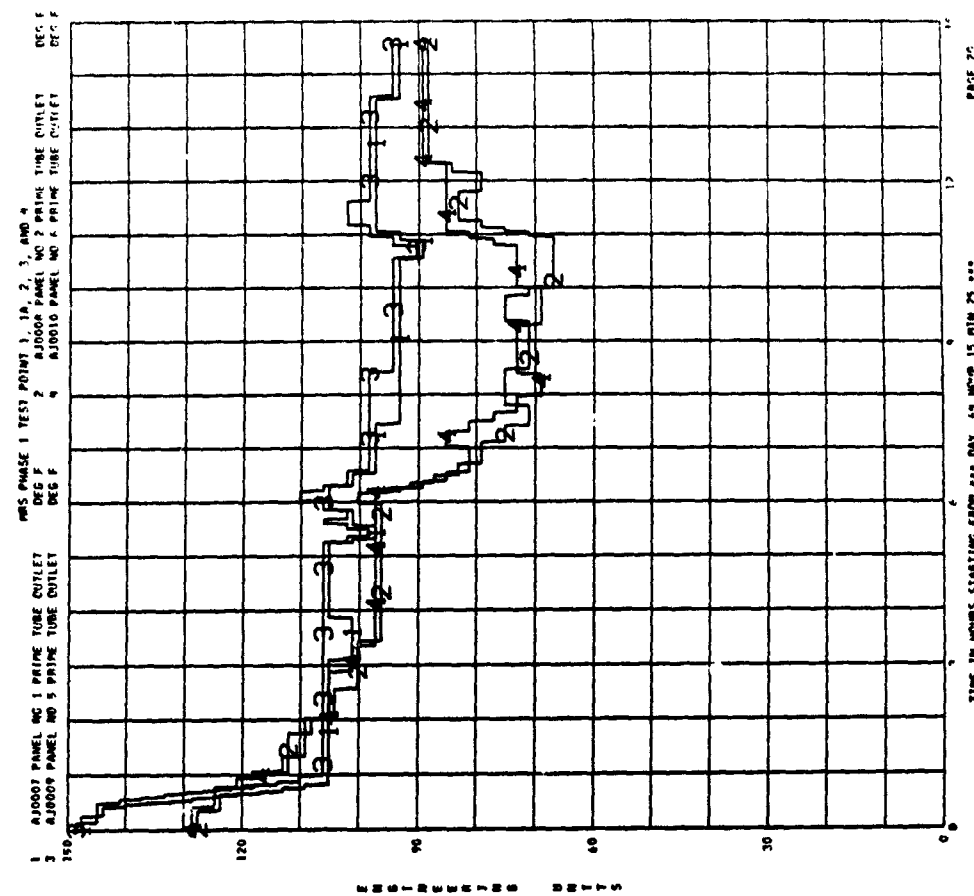
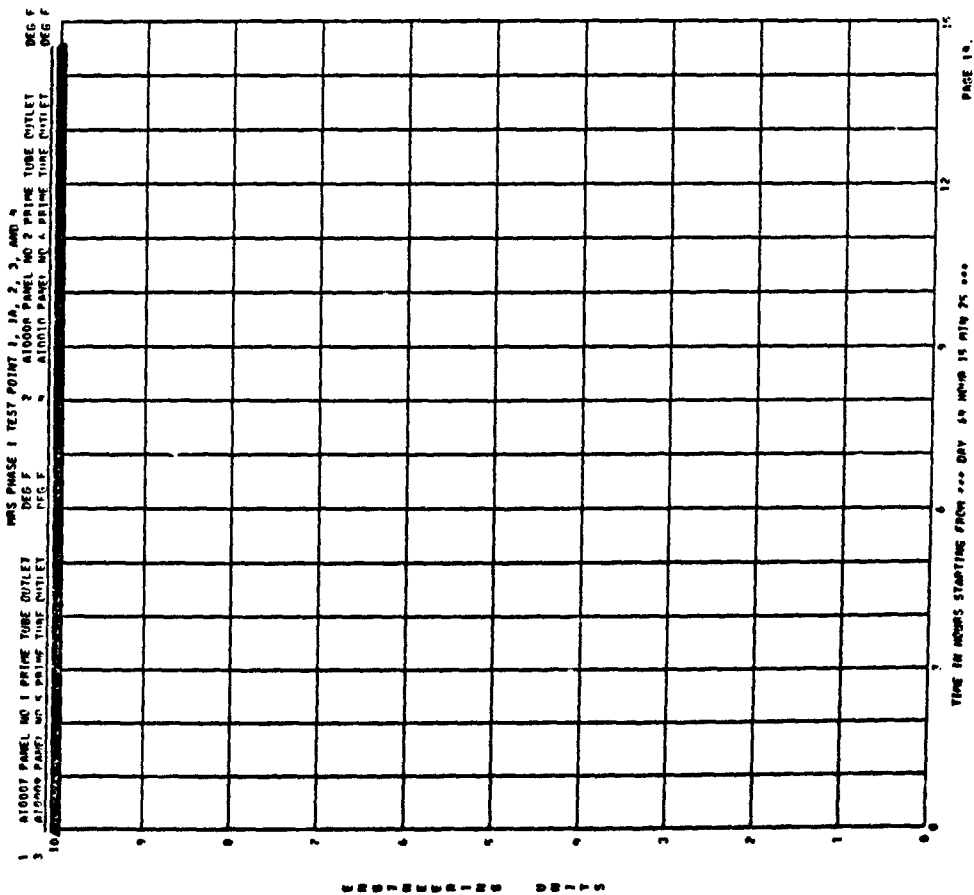
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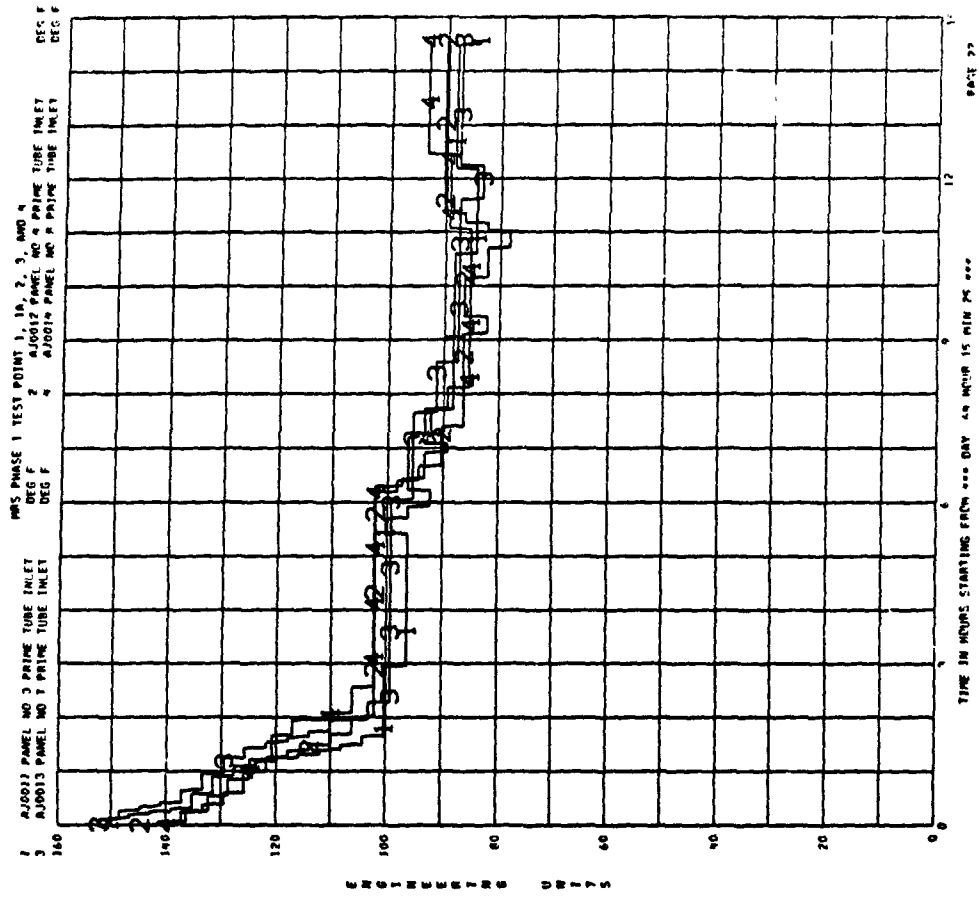
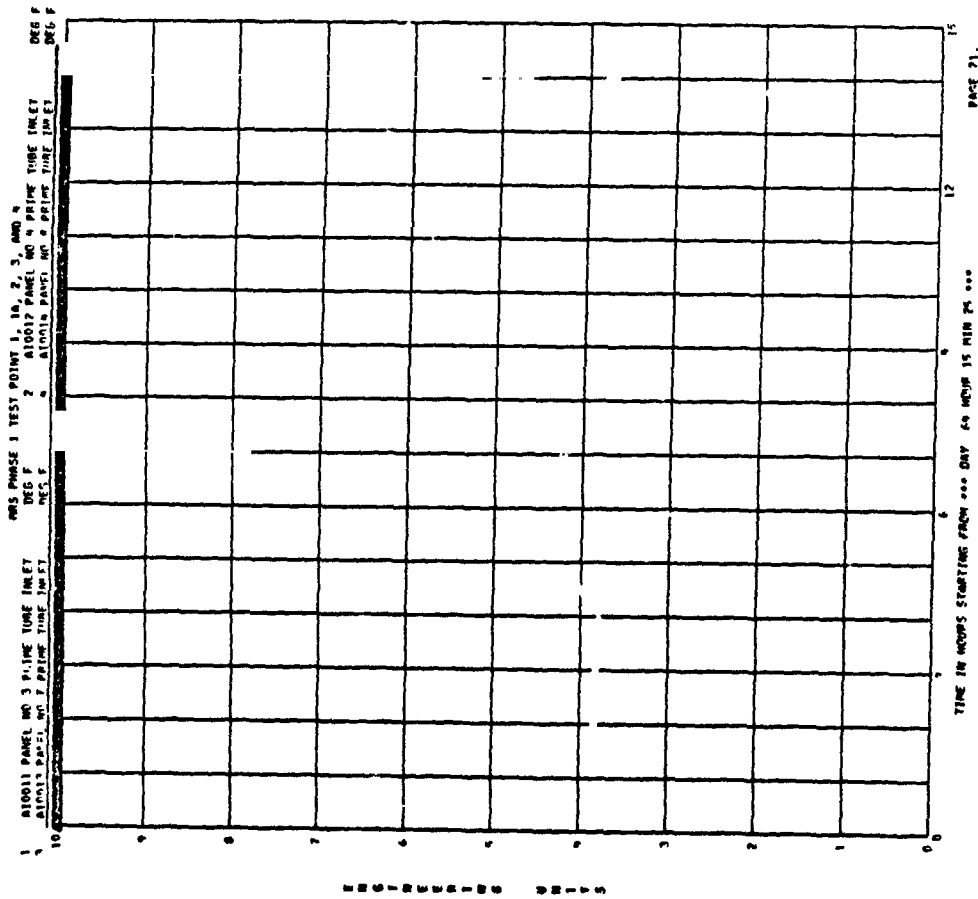
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 5. A10019 PRIME TUBES OUTLET MIX IN CH DEG F
 6. A10019 PRIME TUBES OUTLET MIX IN CH DEG F
 7. A10019 PRIME TUBES OUTLET MIX IN CH DEG F
 8. A10019 PRIME TUBES OUTLET MIX IN CH DEG F
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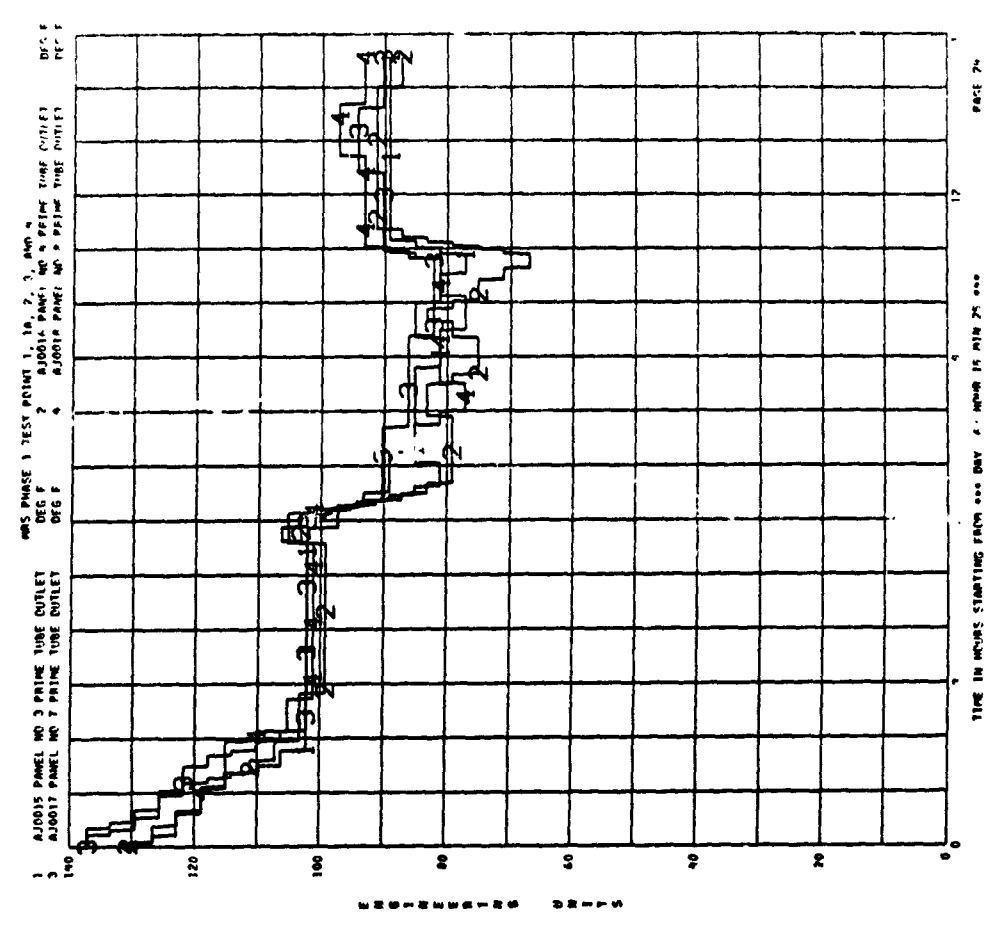
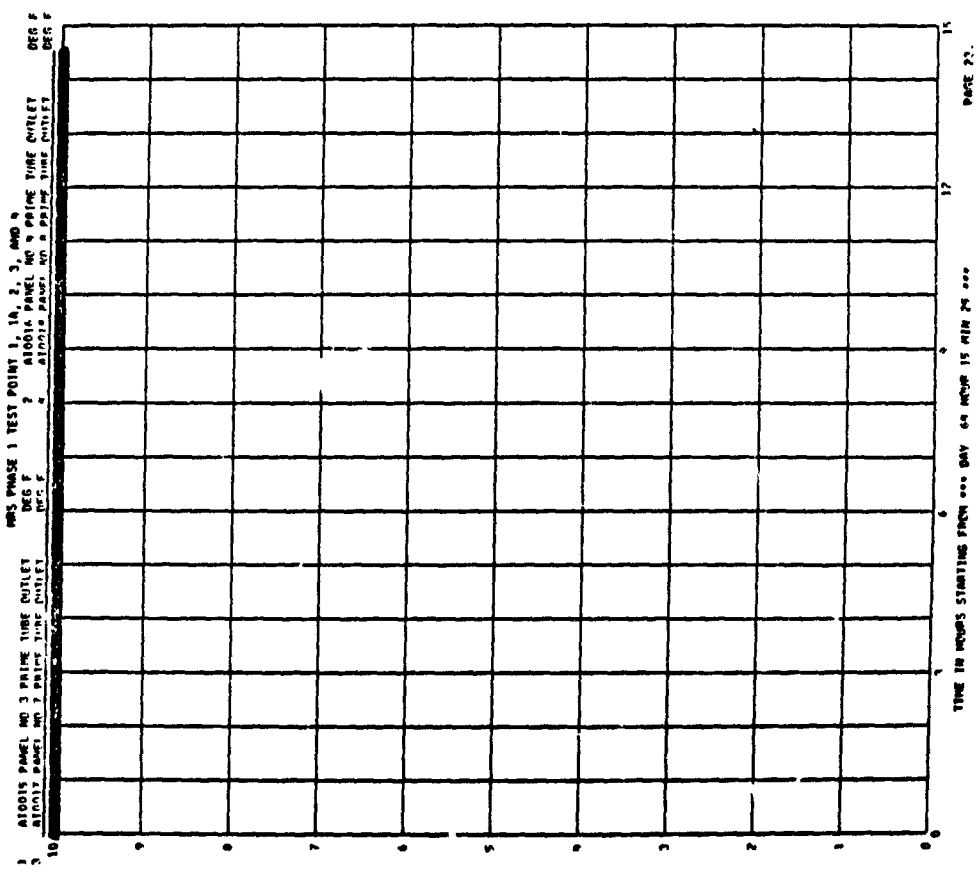


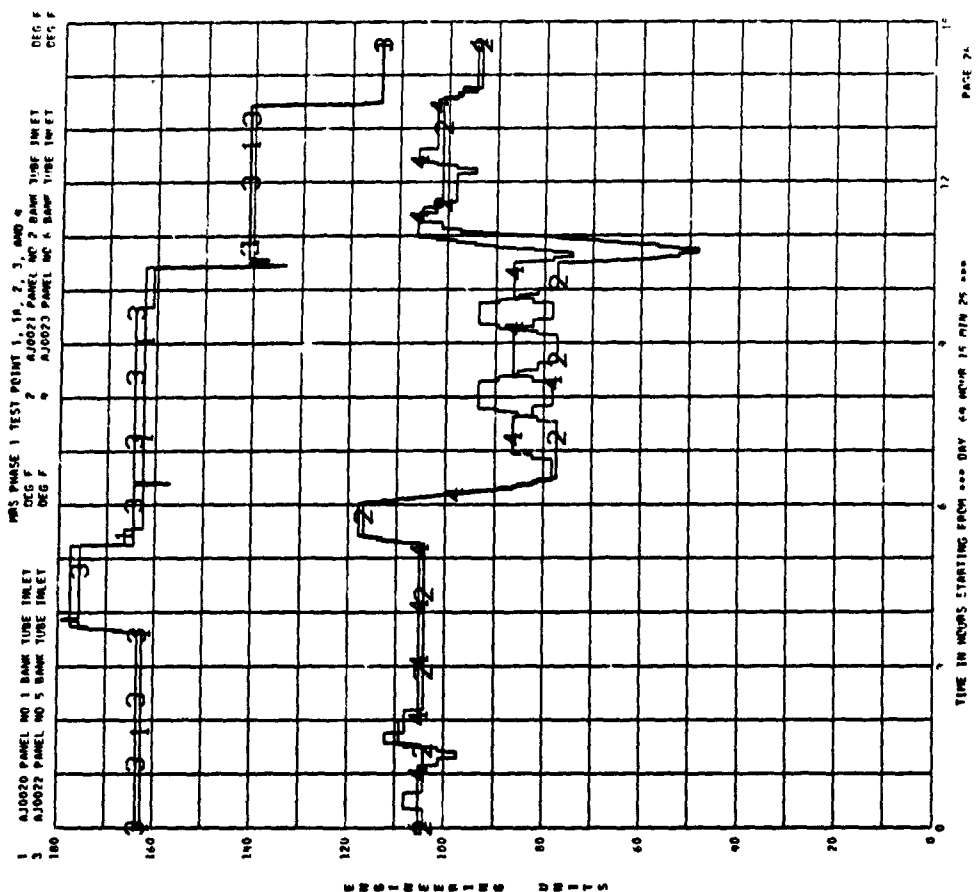
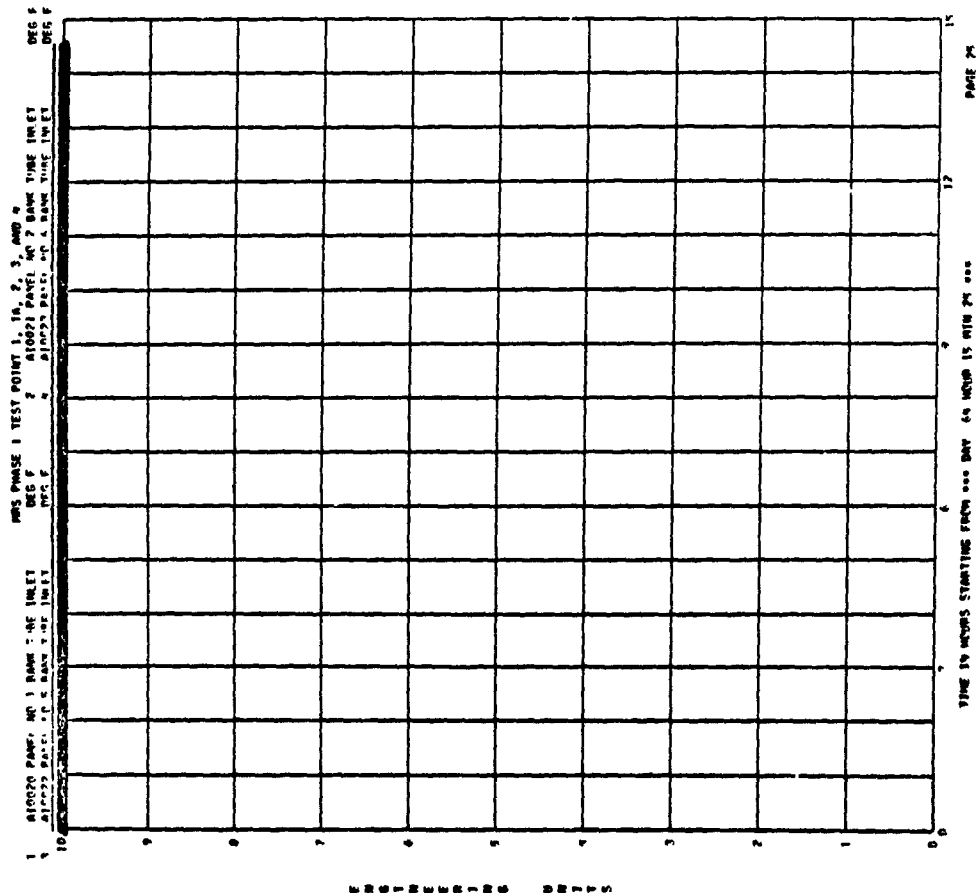
PAGE 19

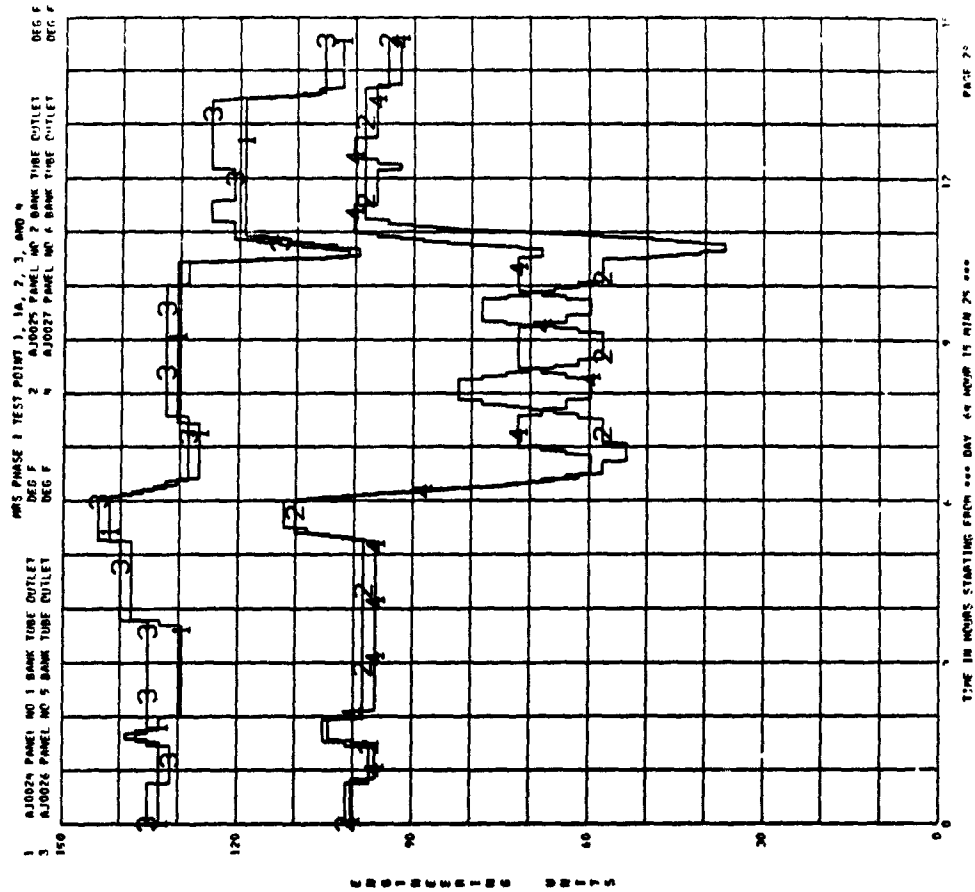
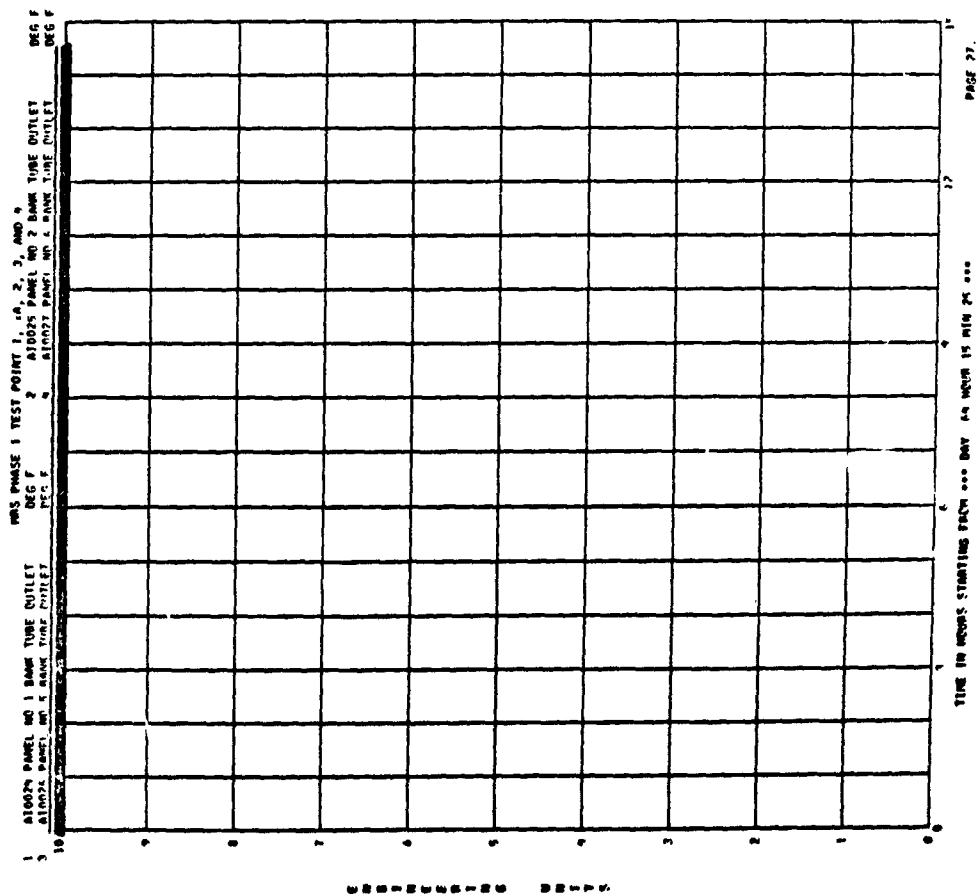


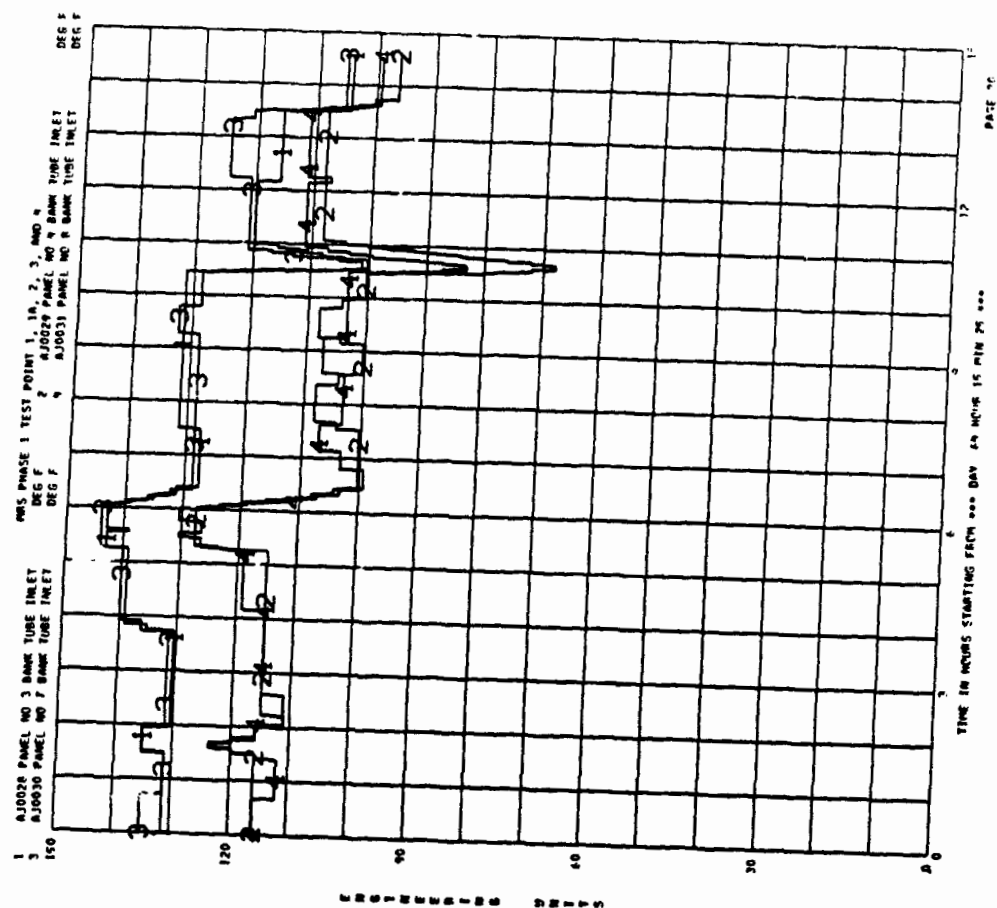
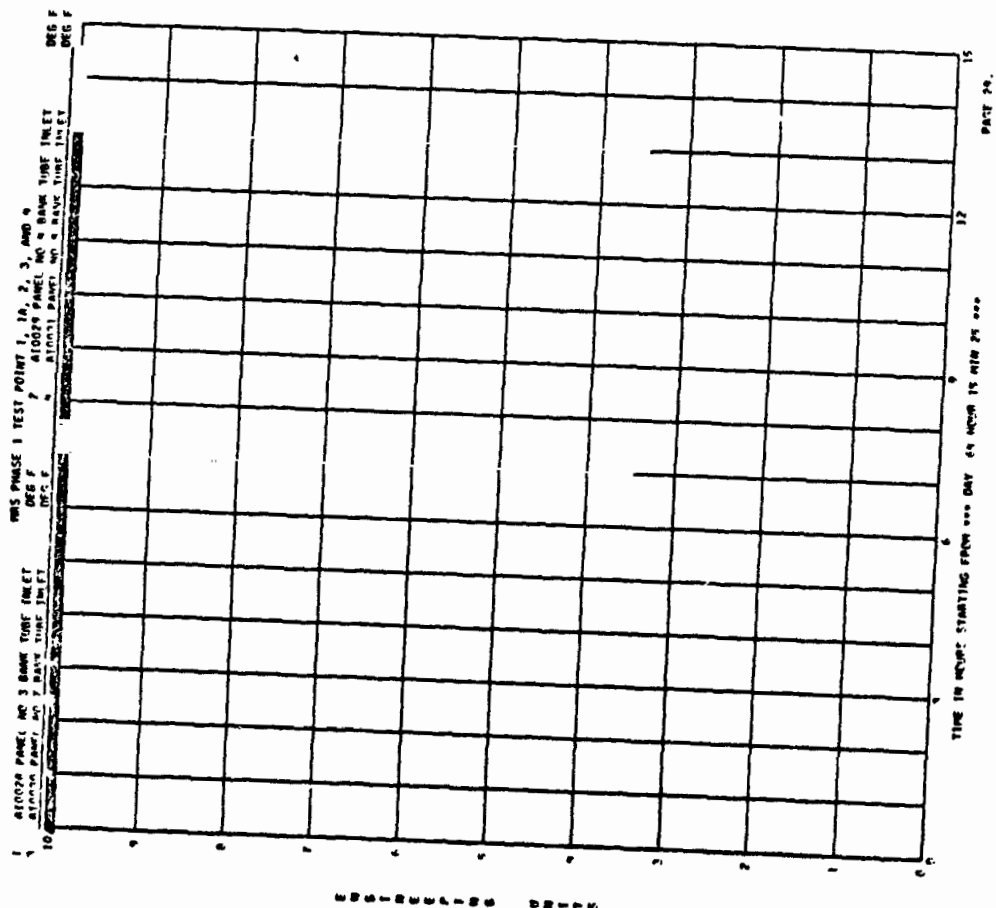


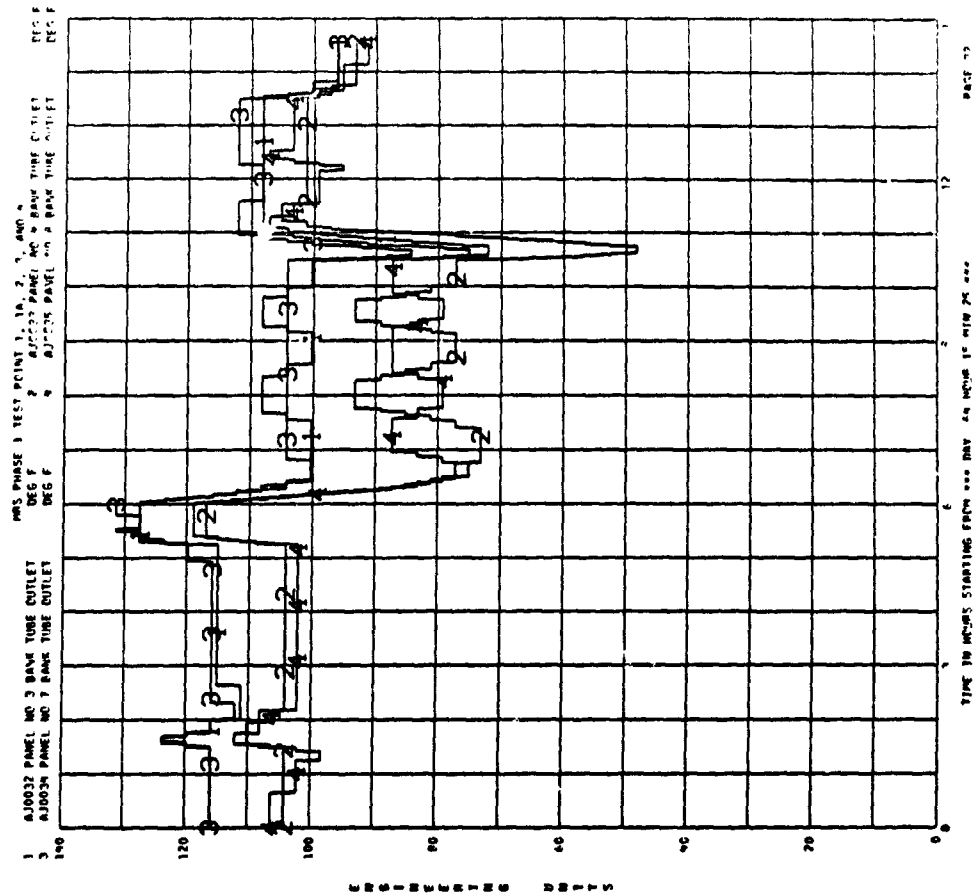
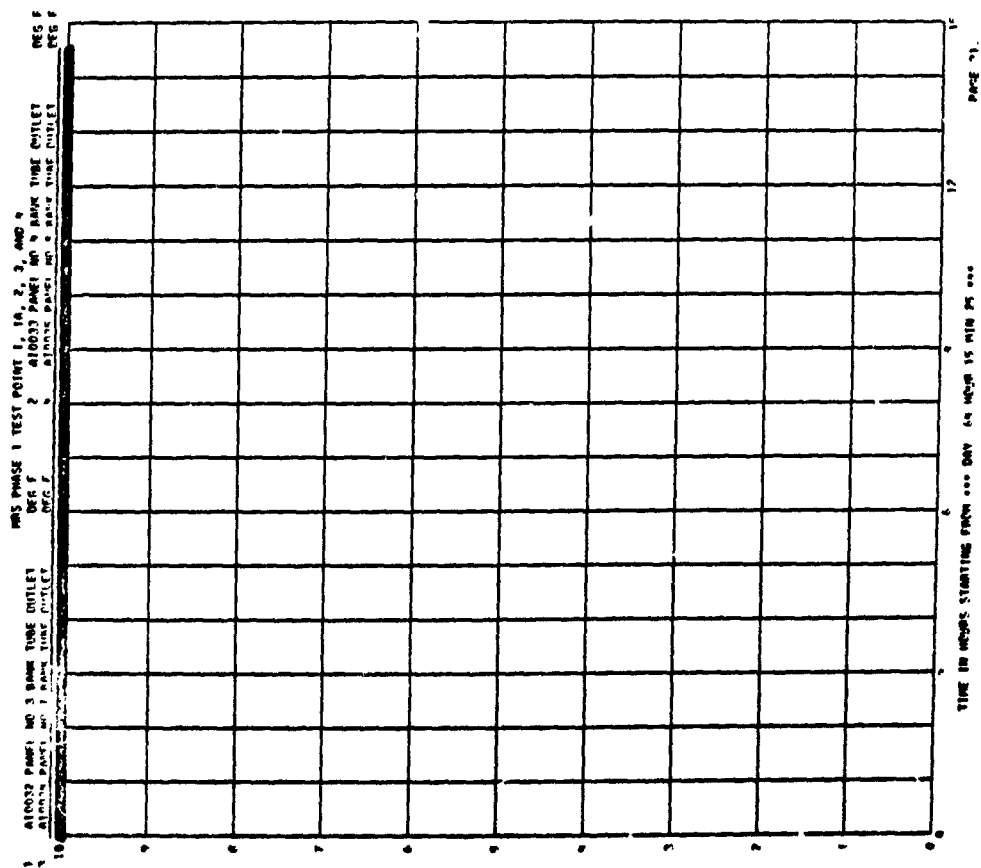


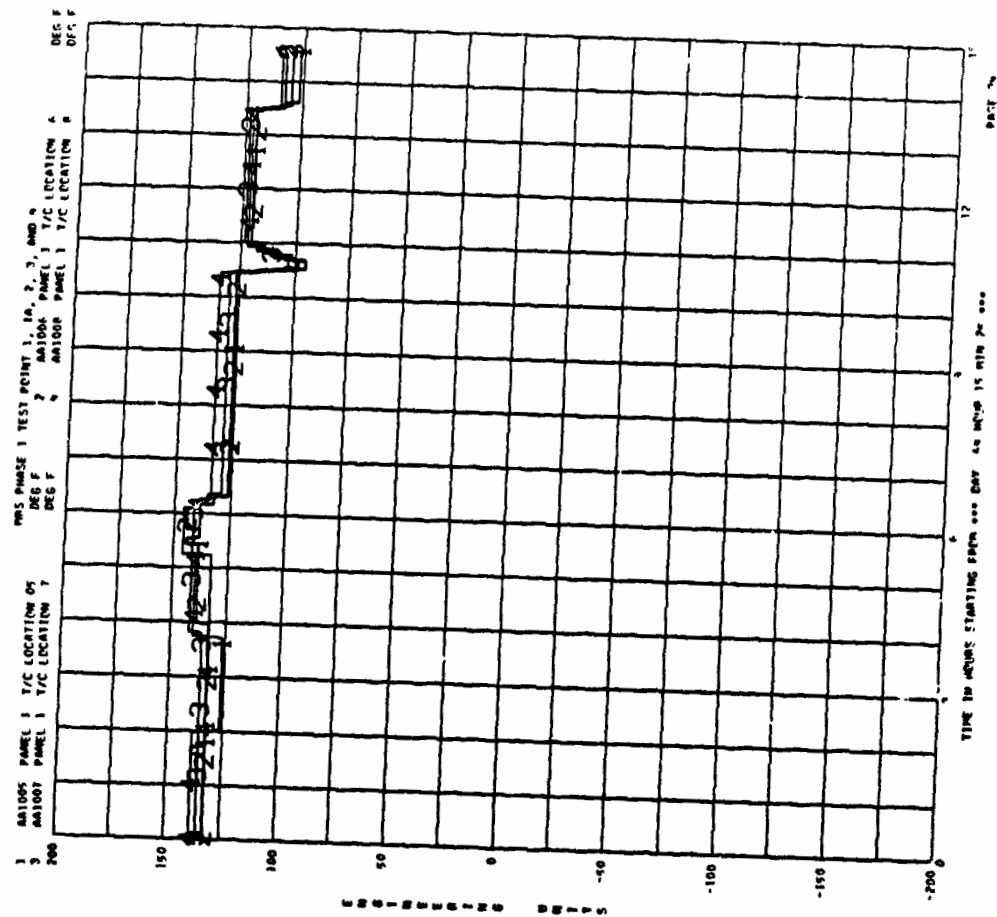
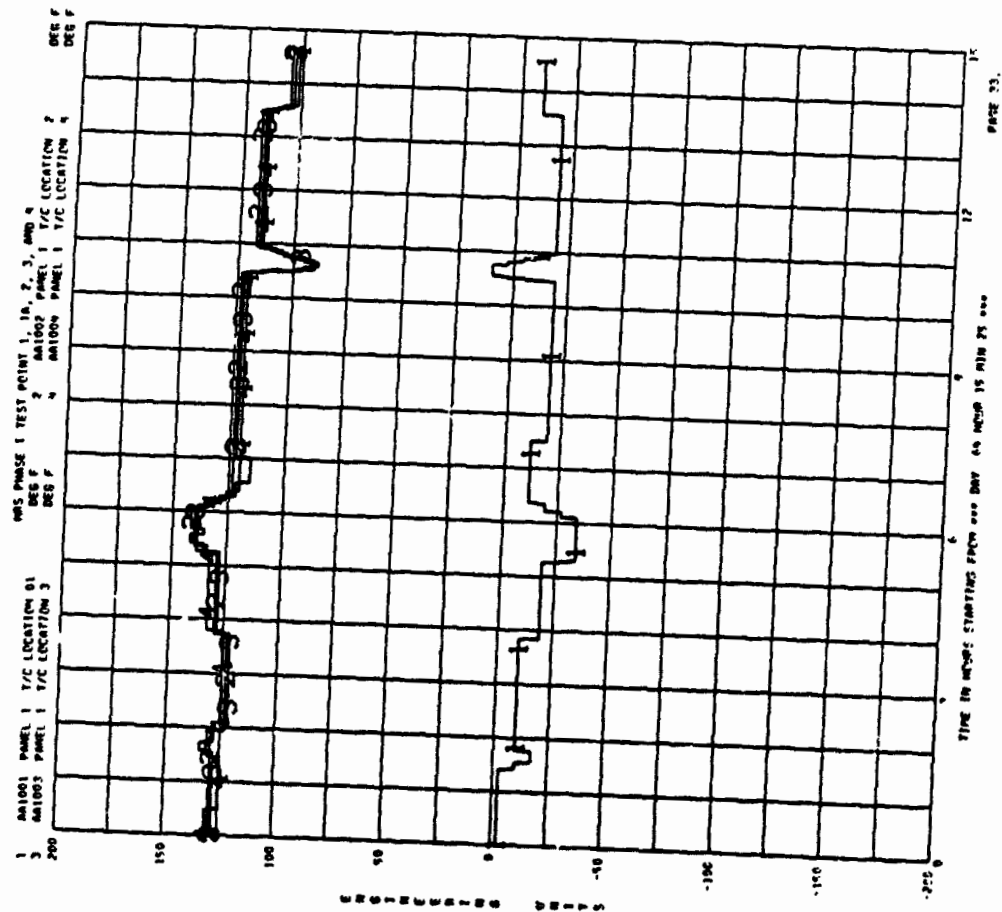


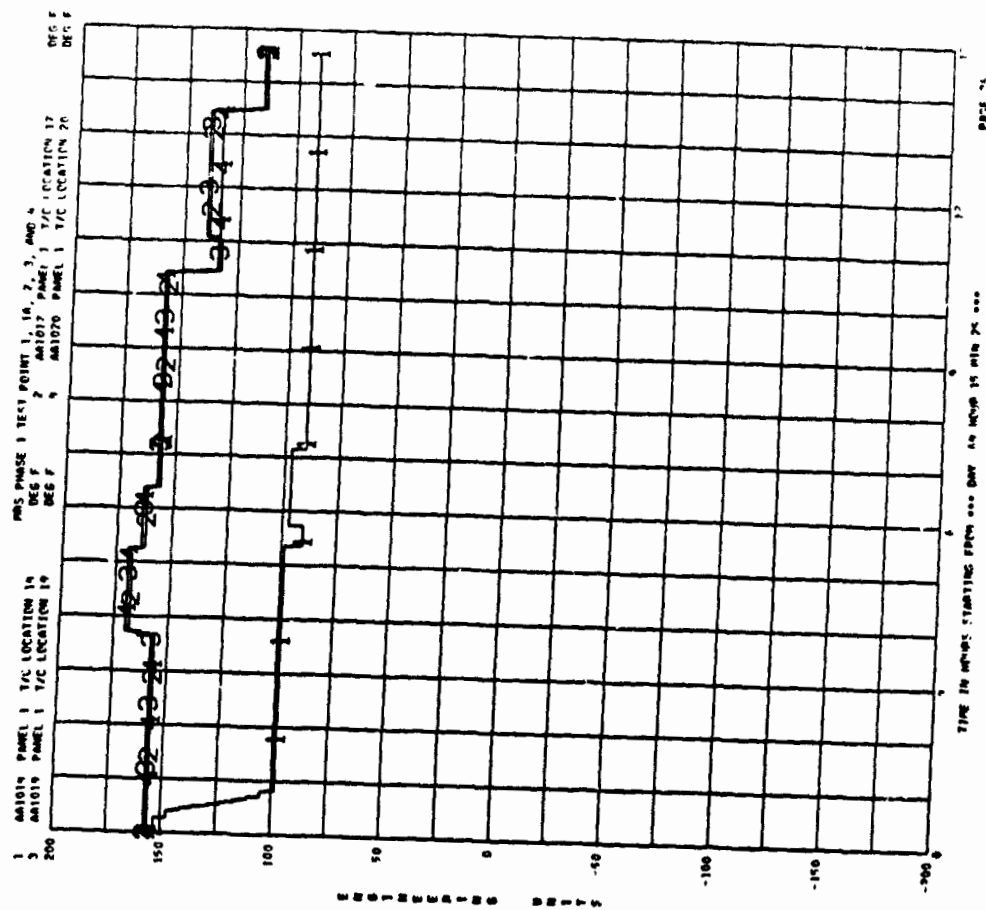
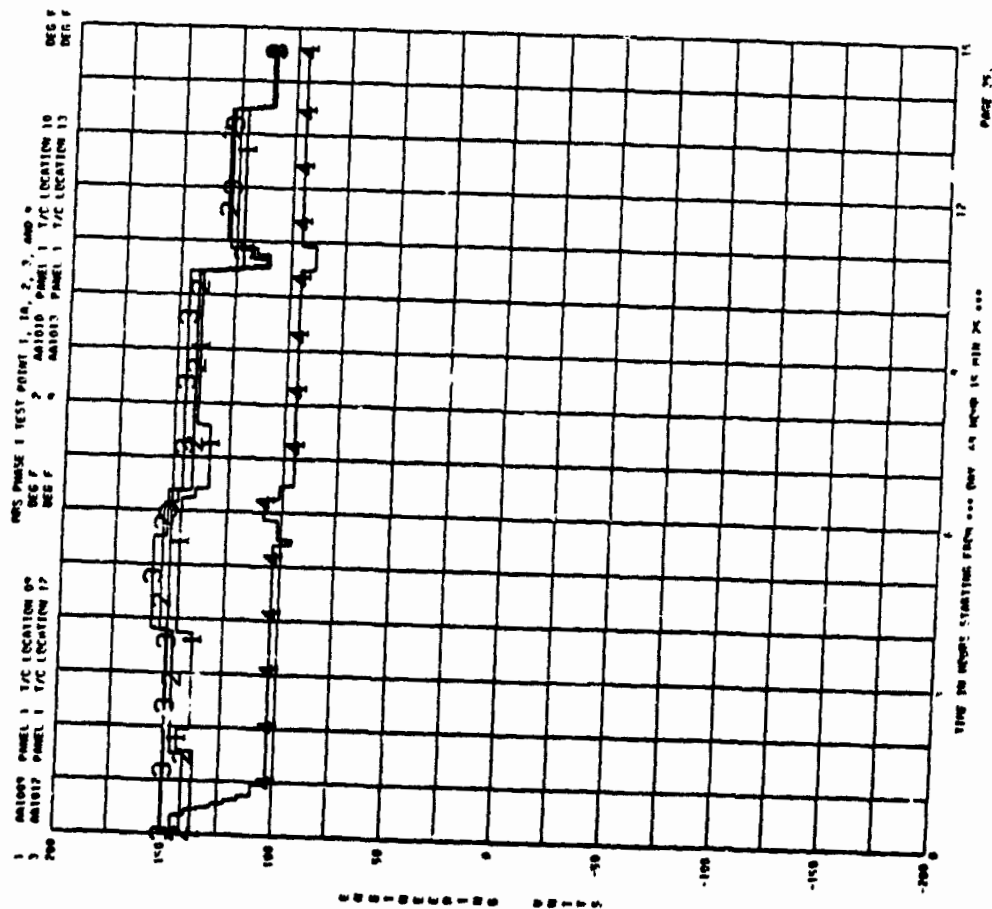


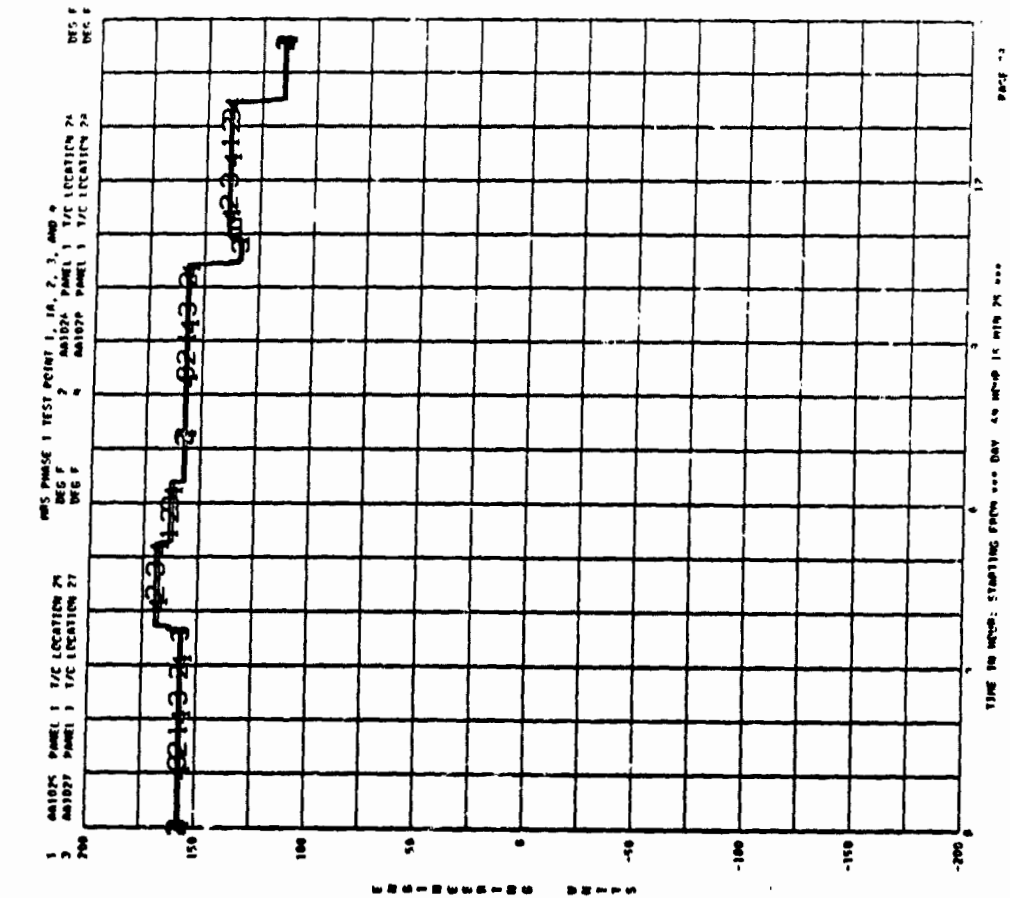


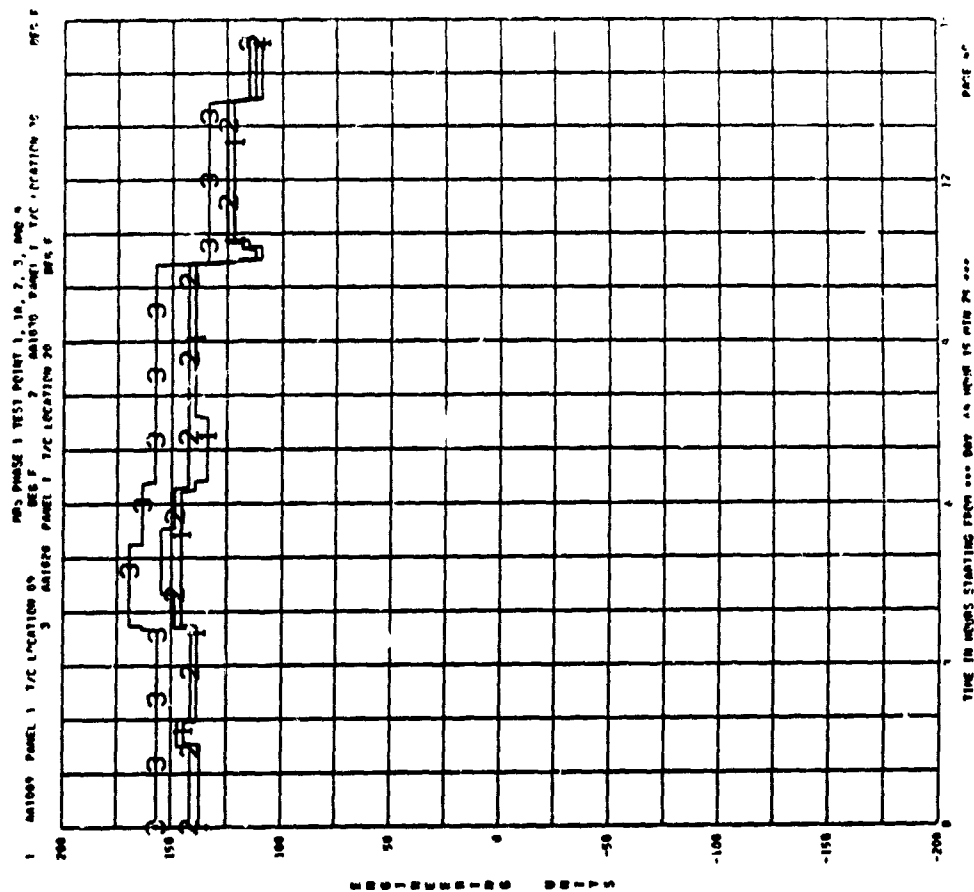
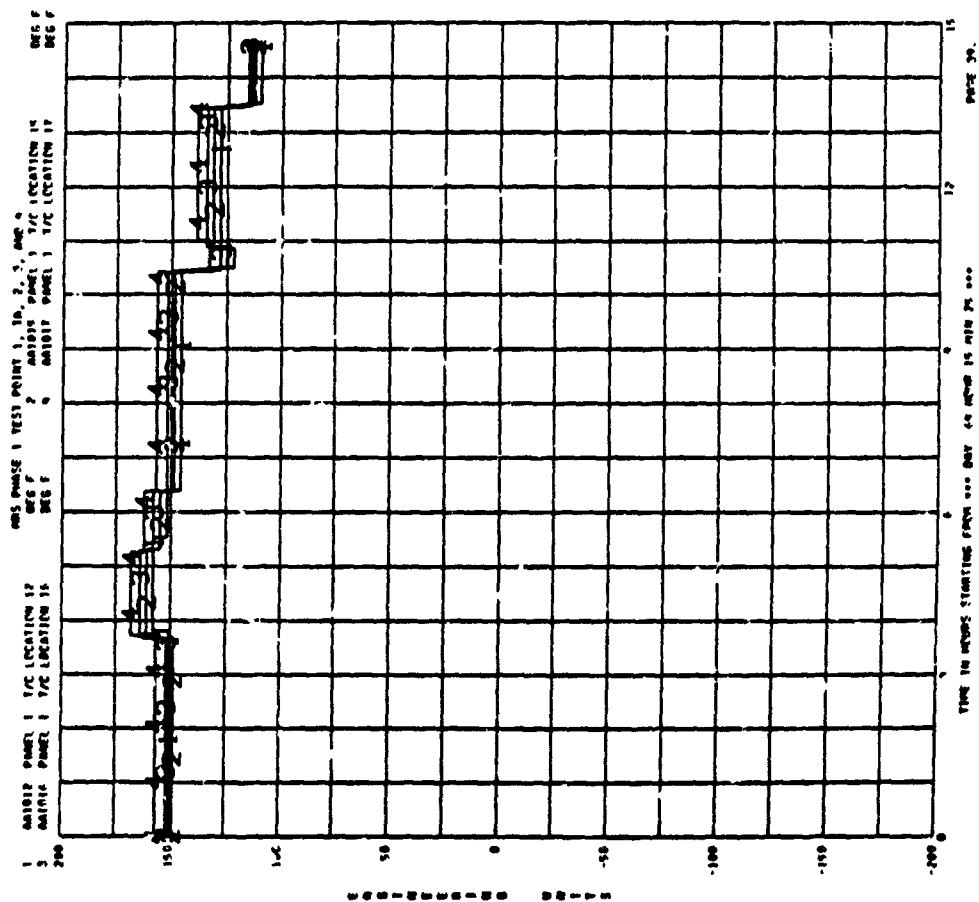


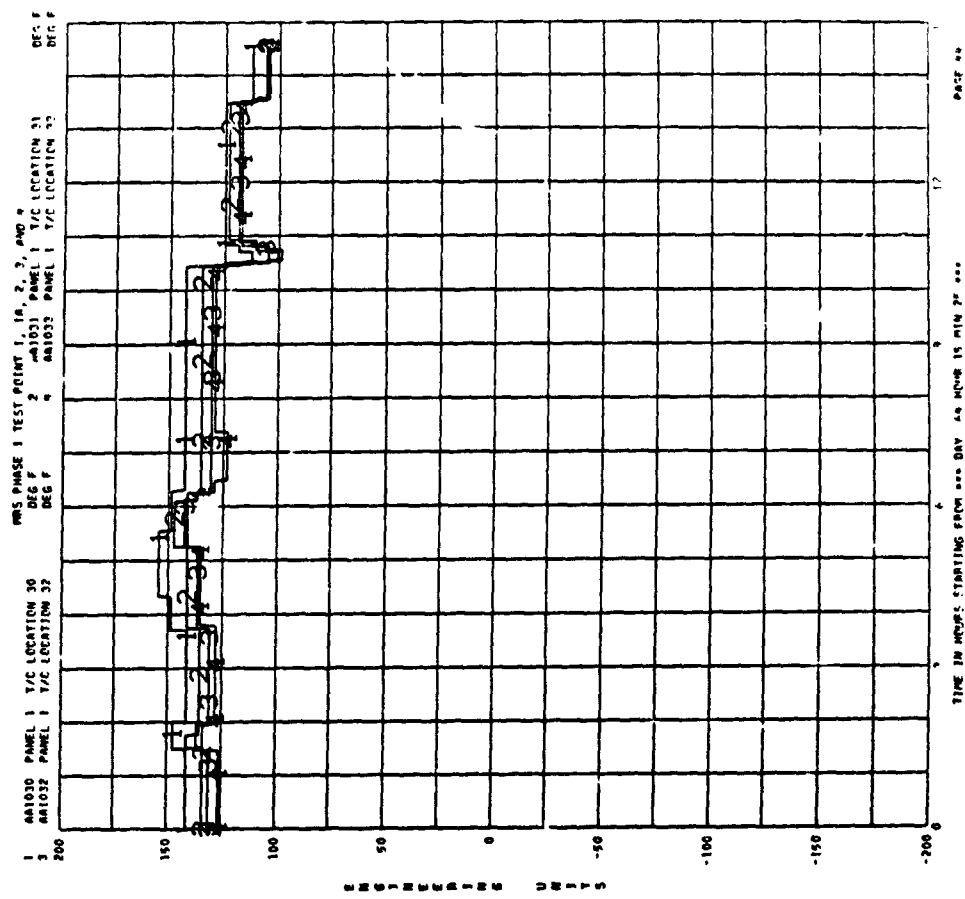
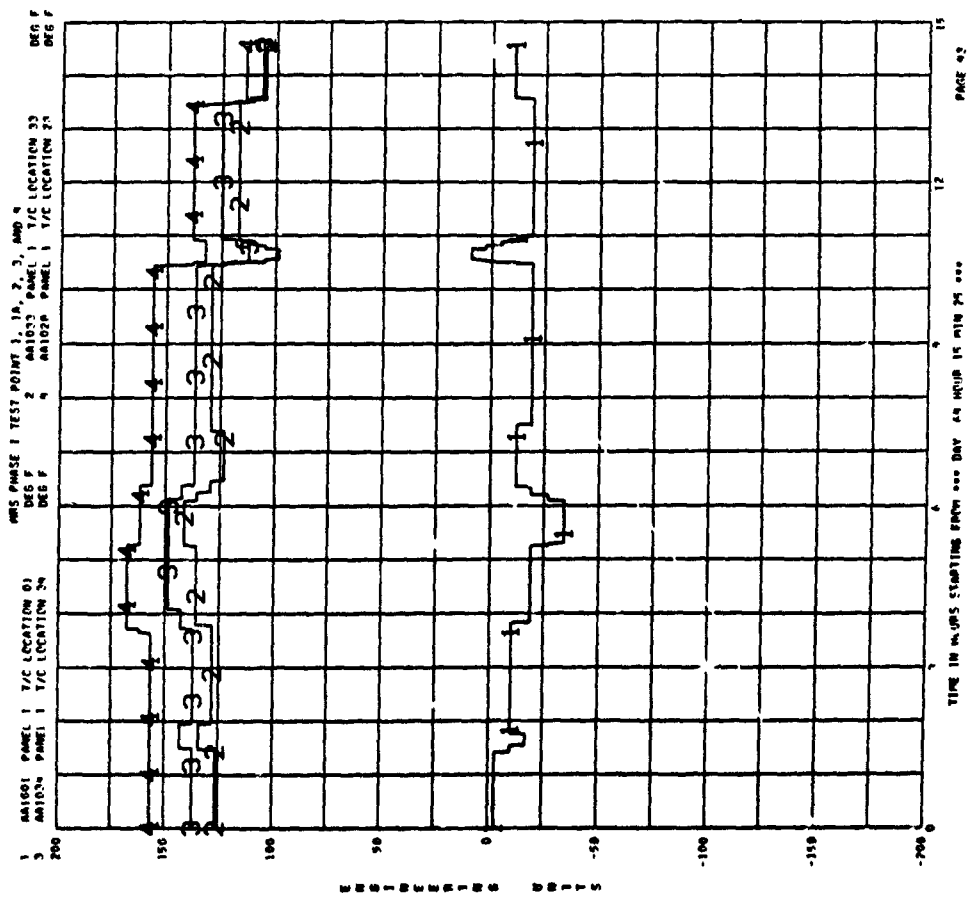


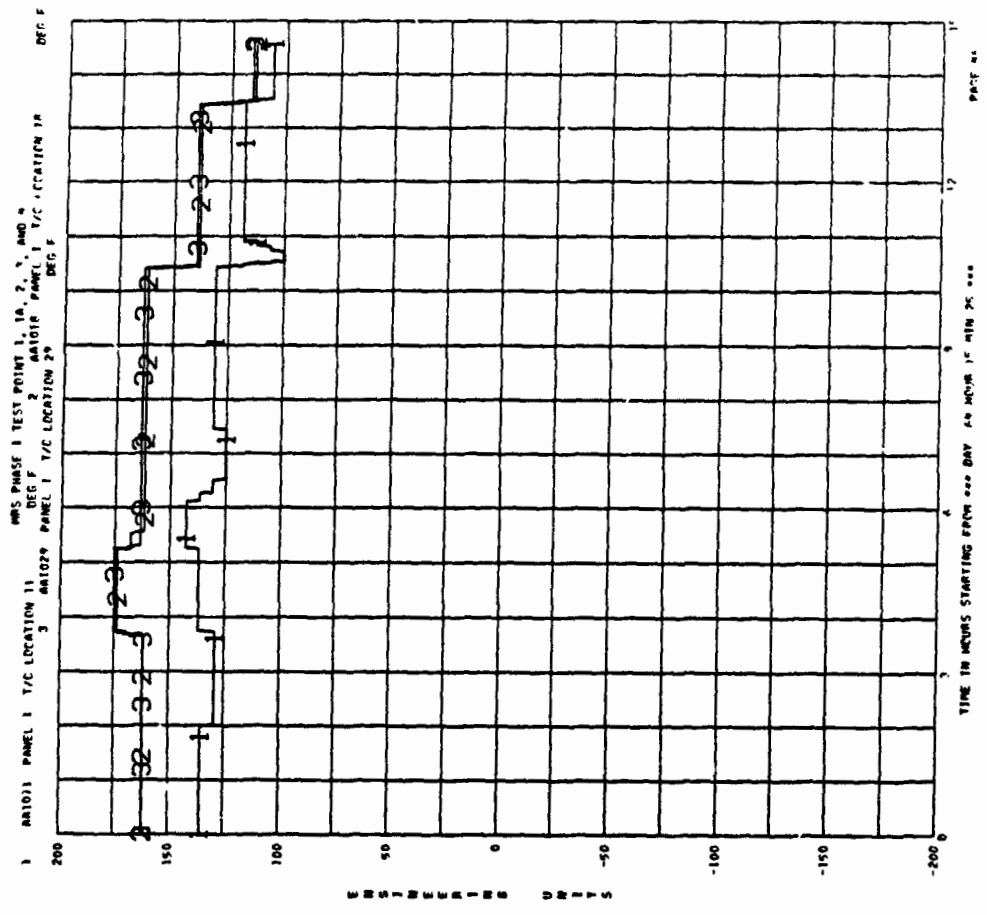
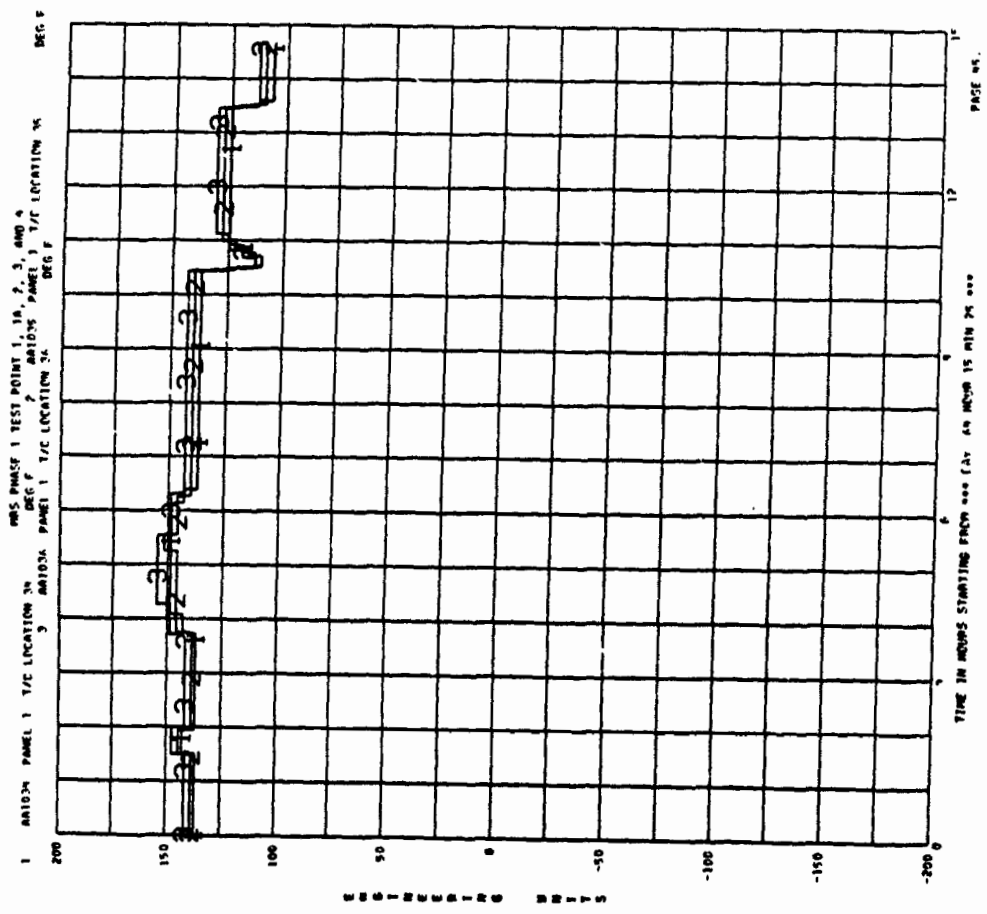


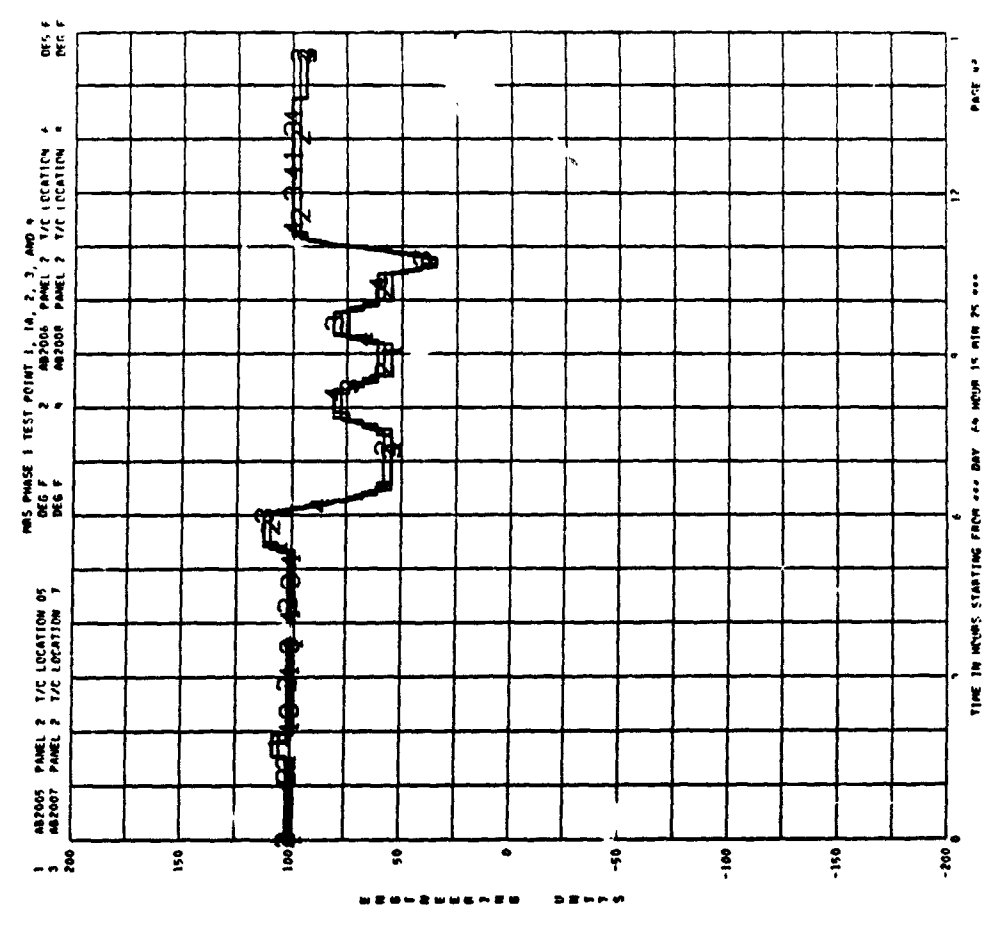
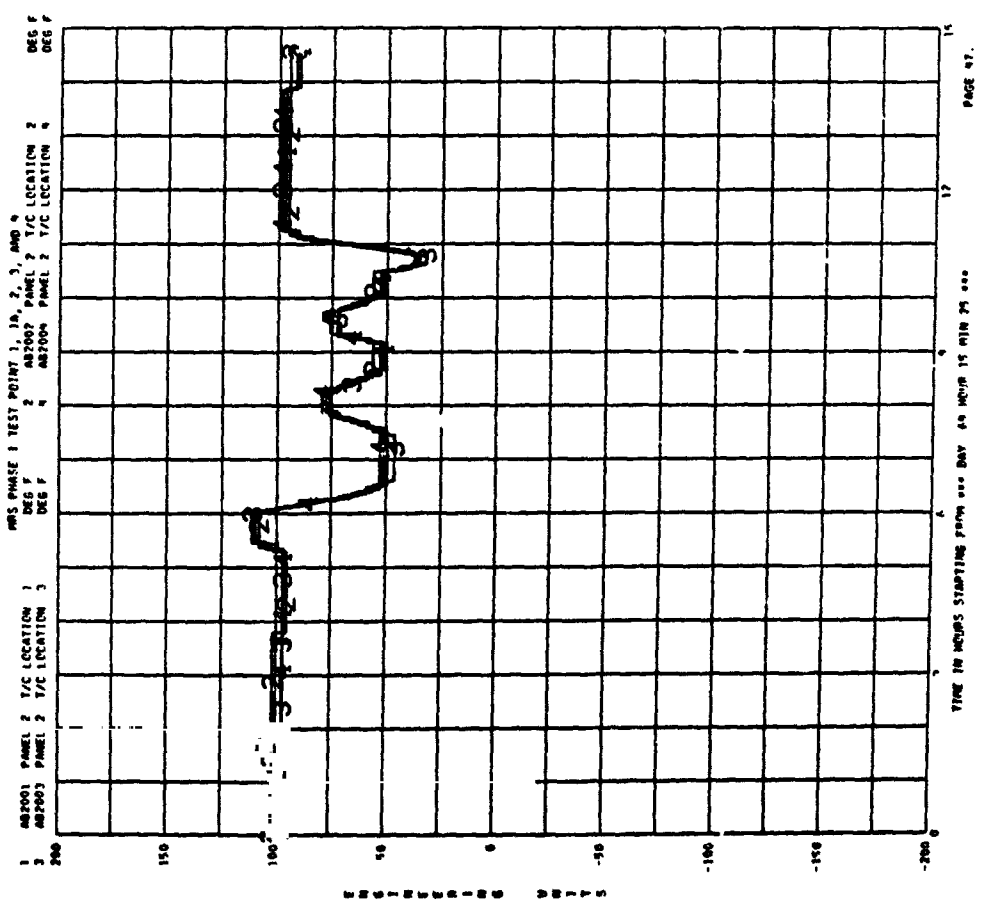


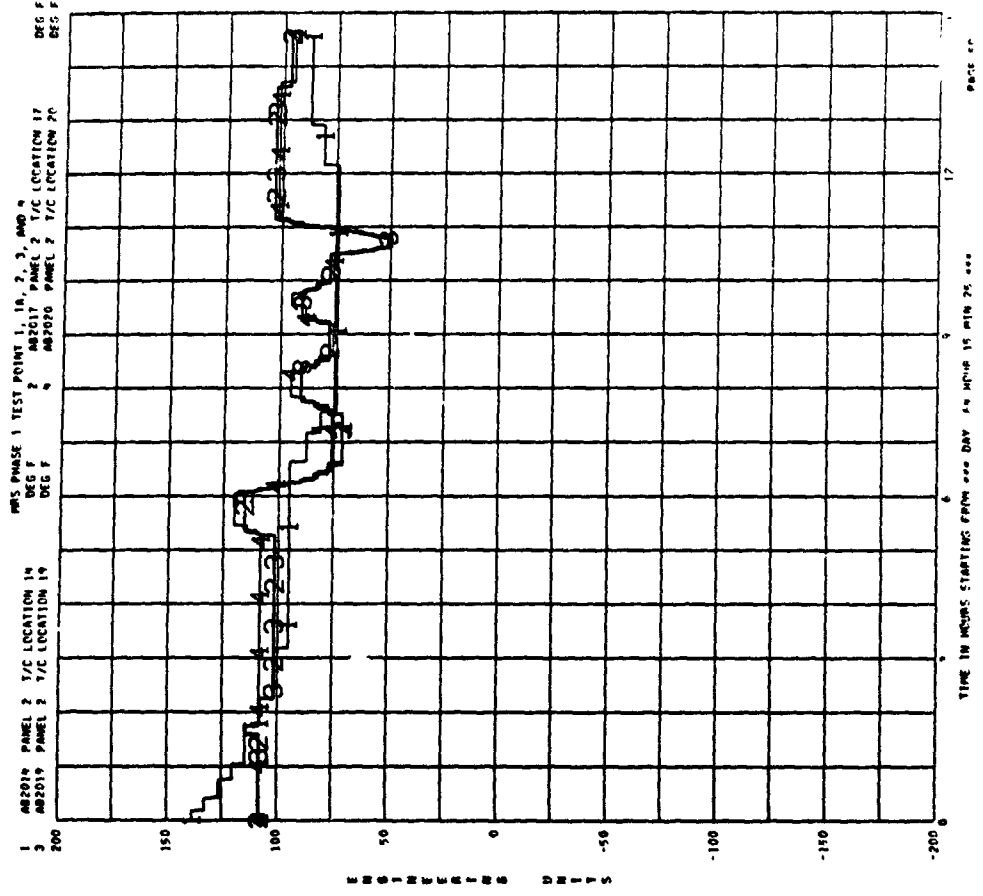
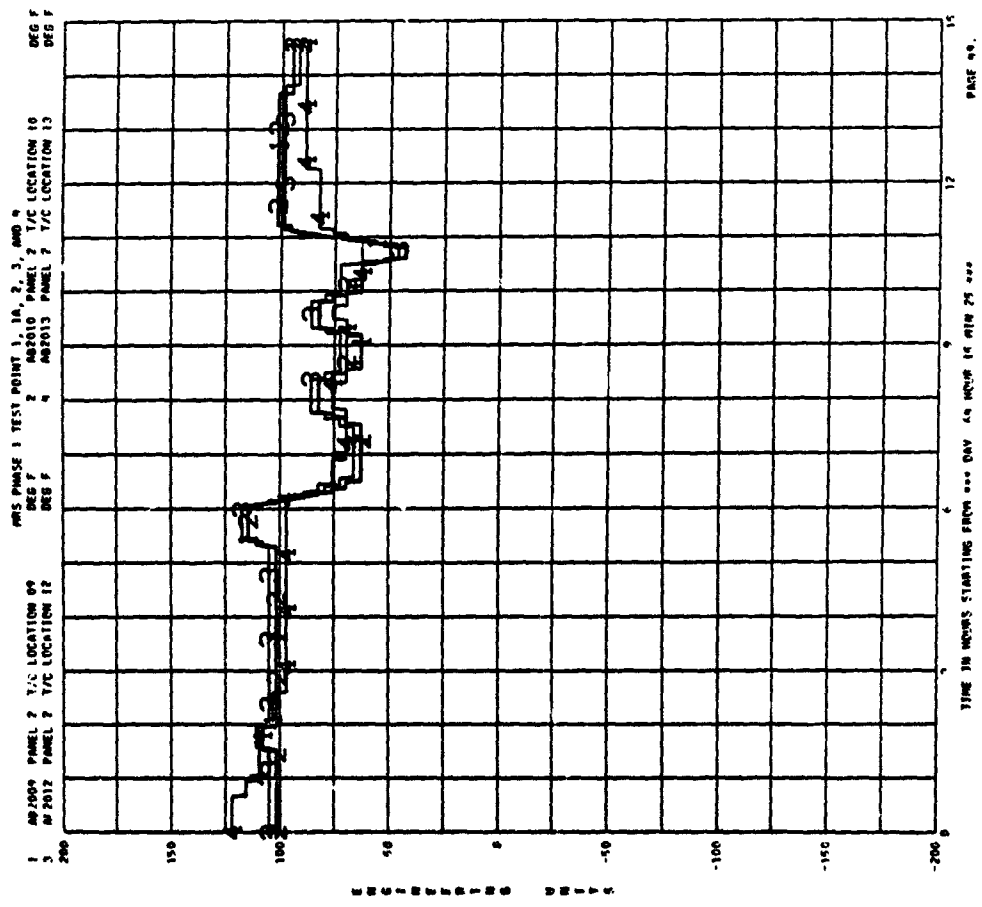


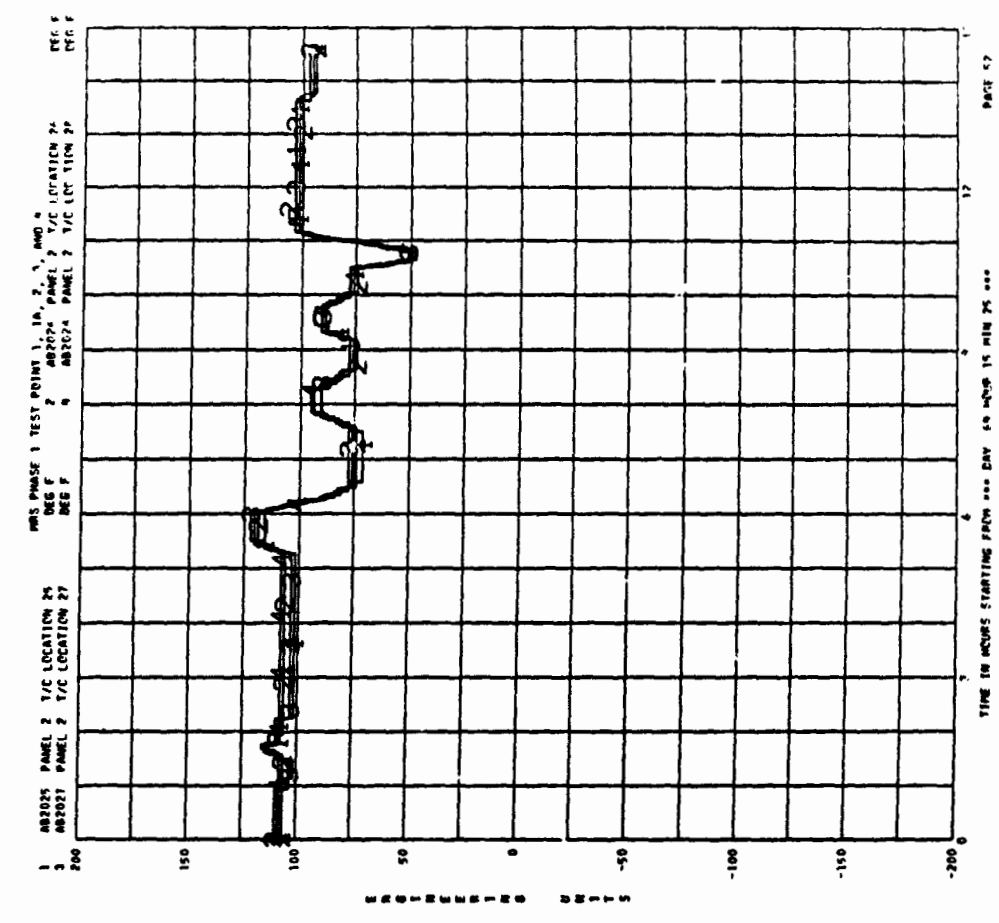
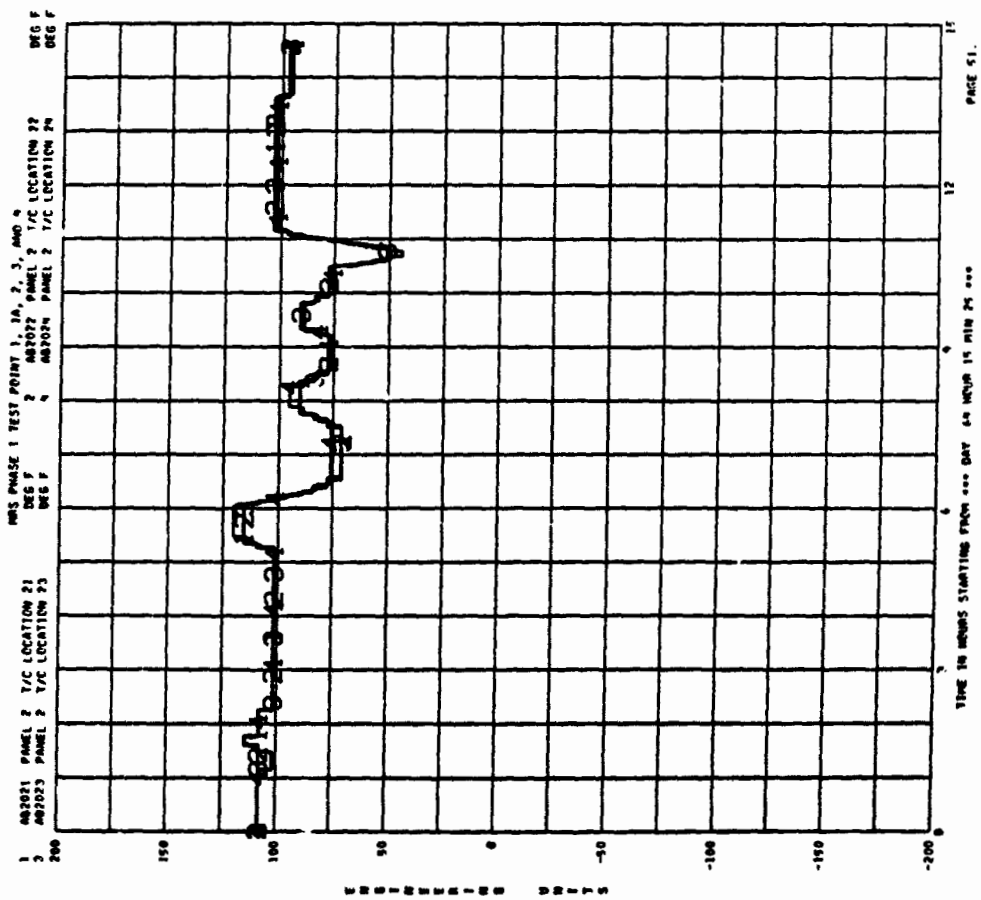


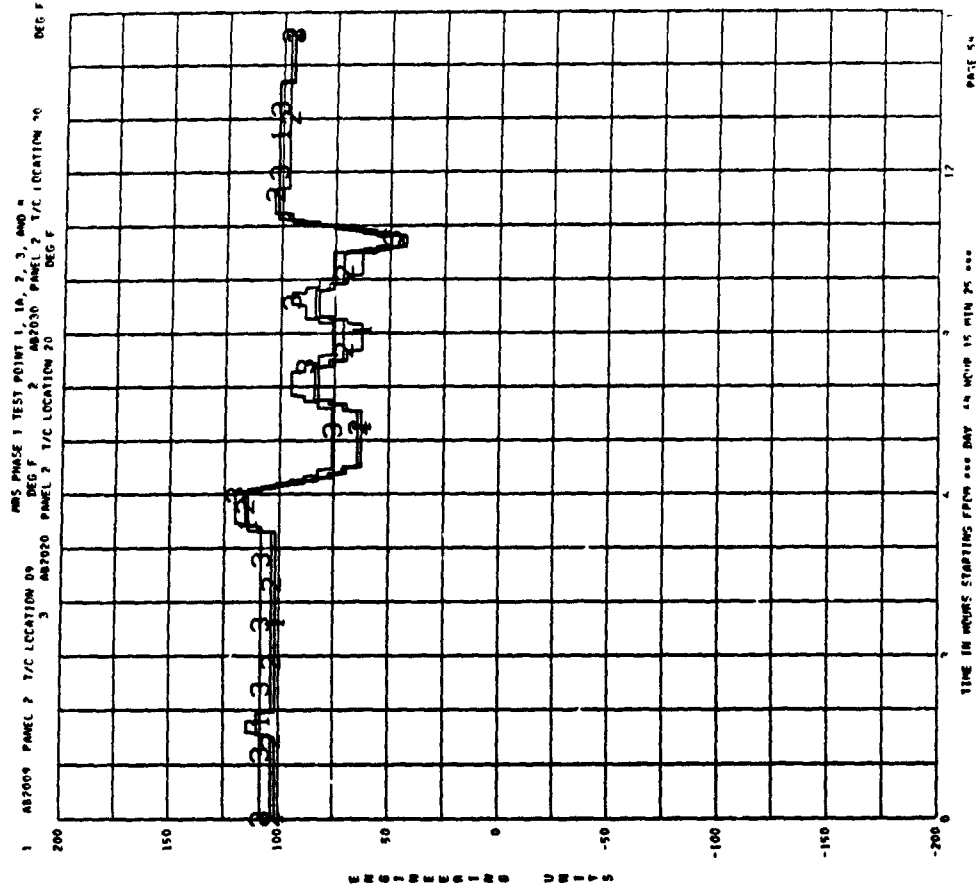
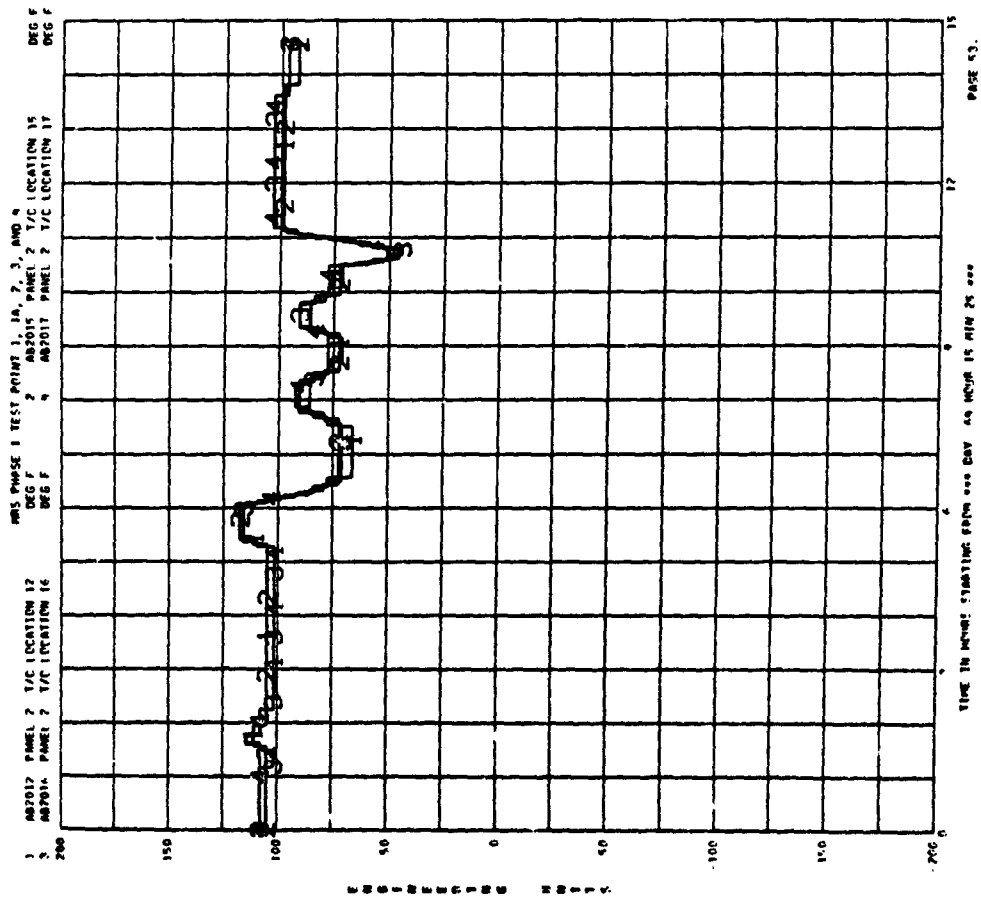


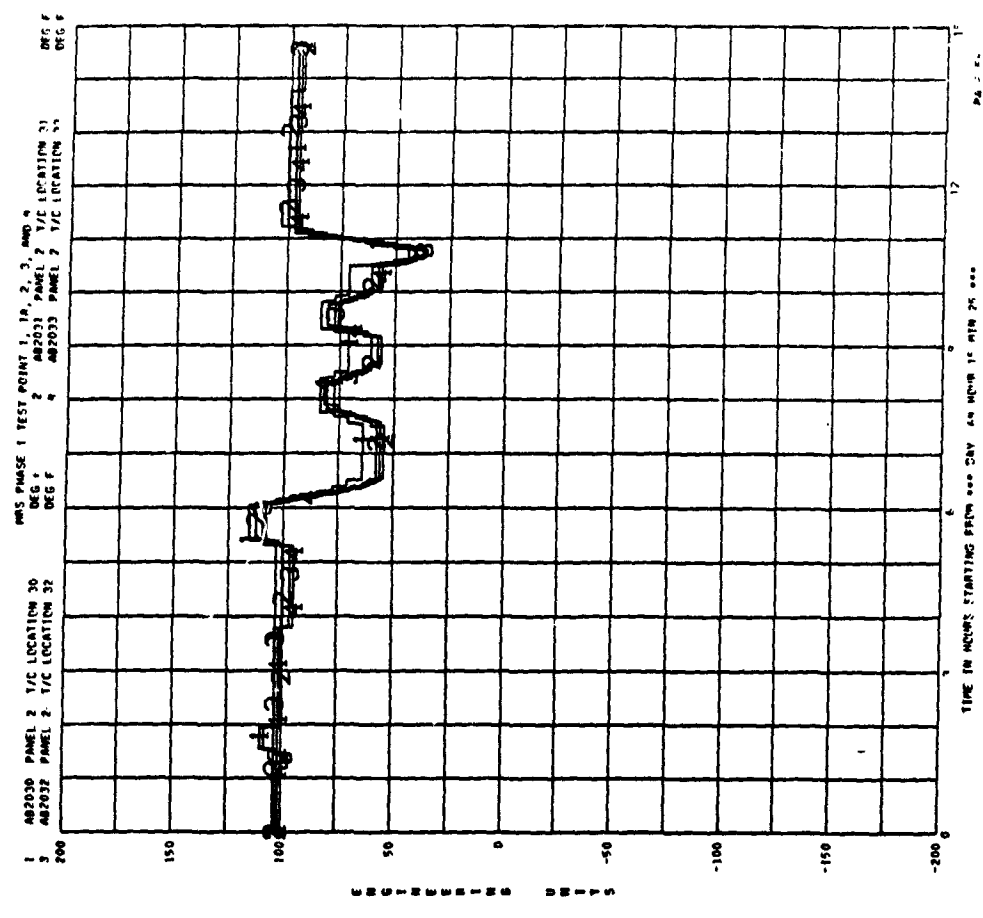
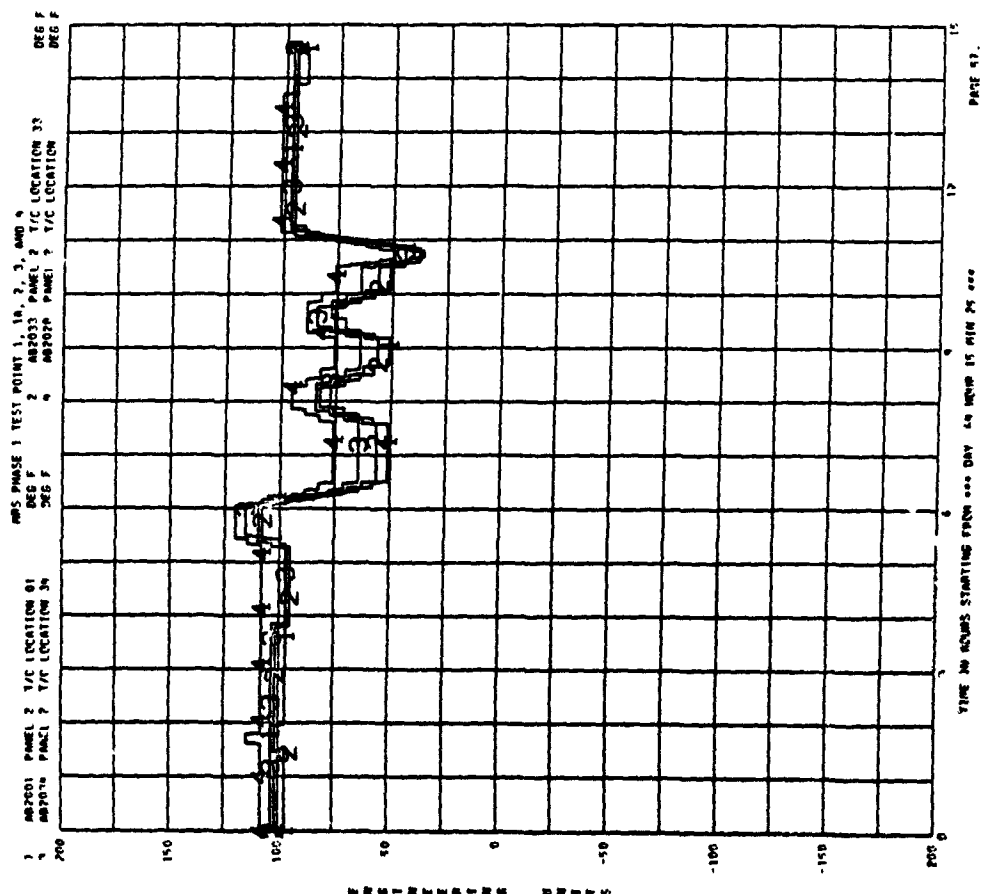


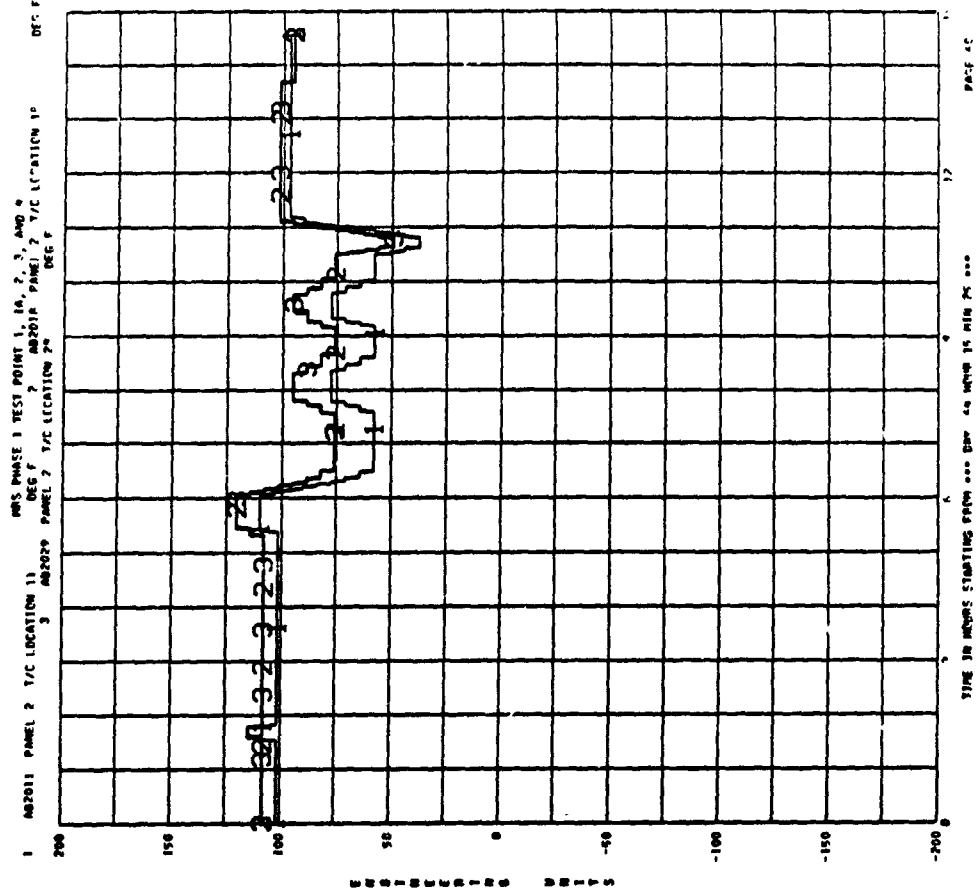
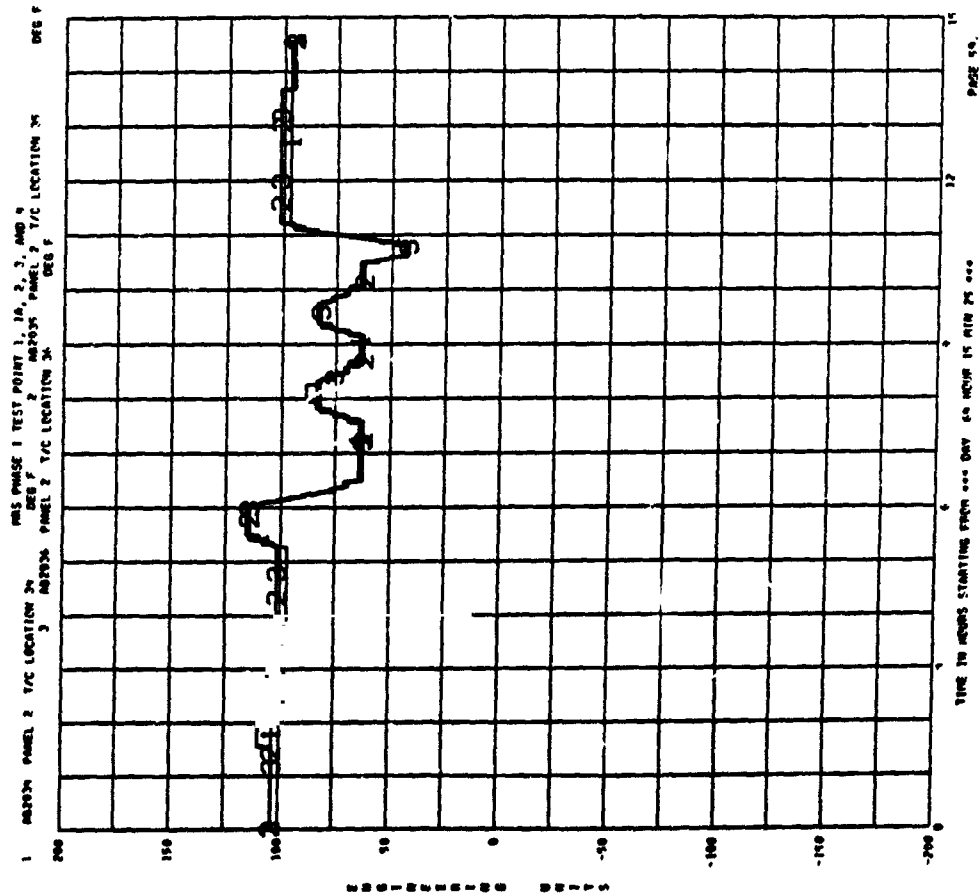


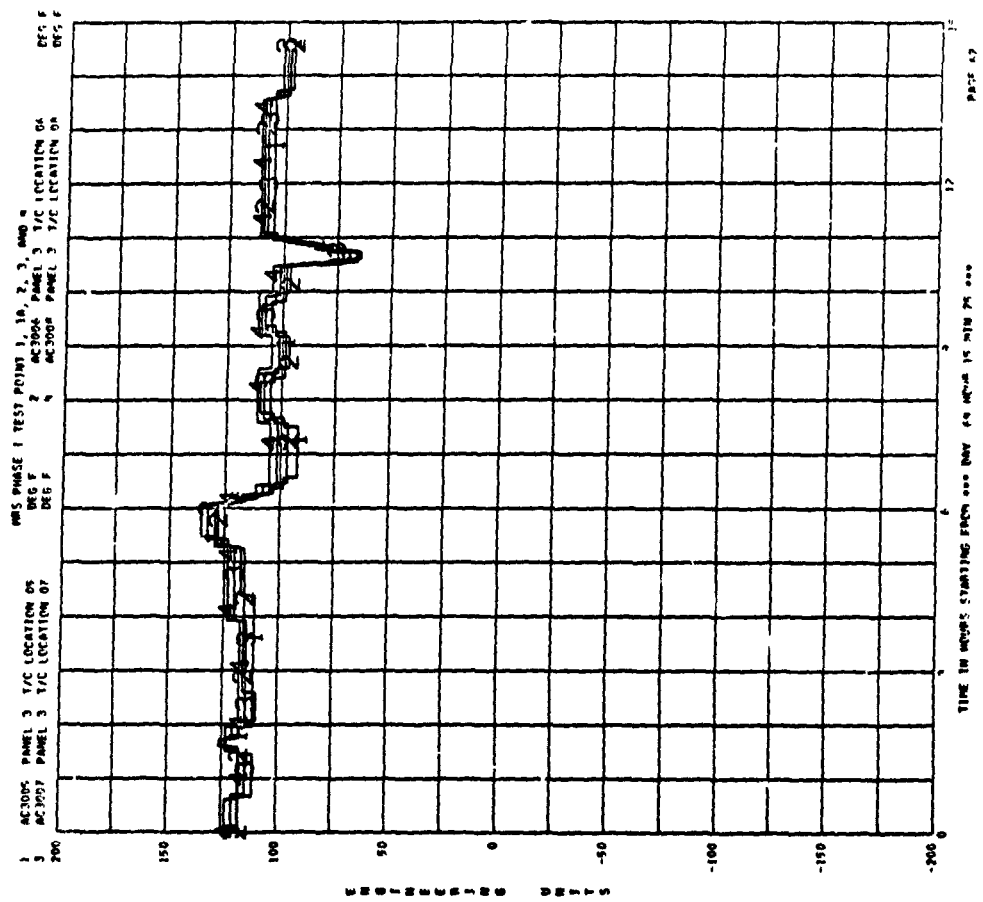
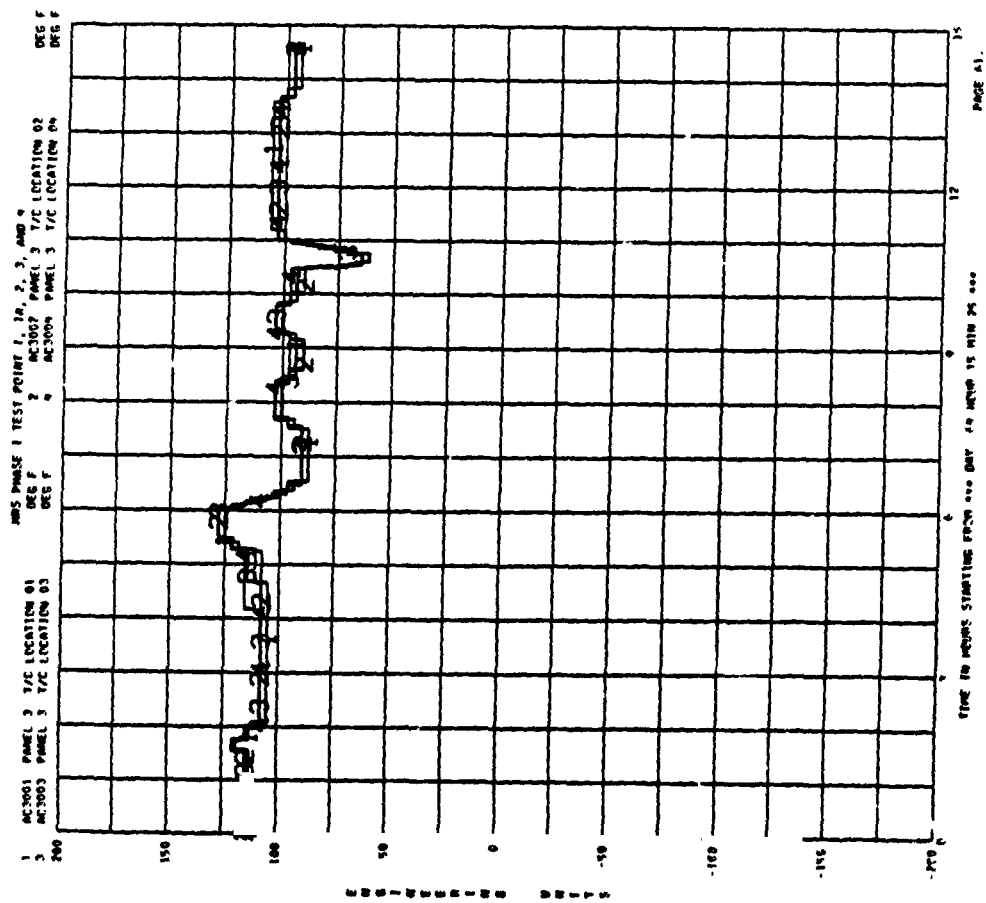


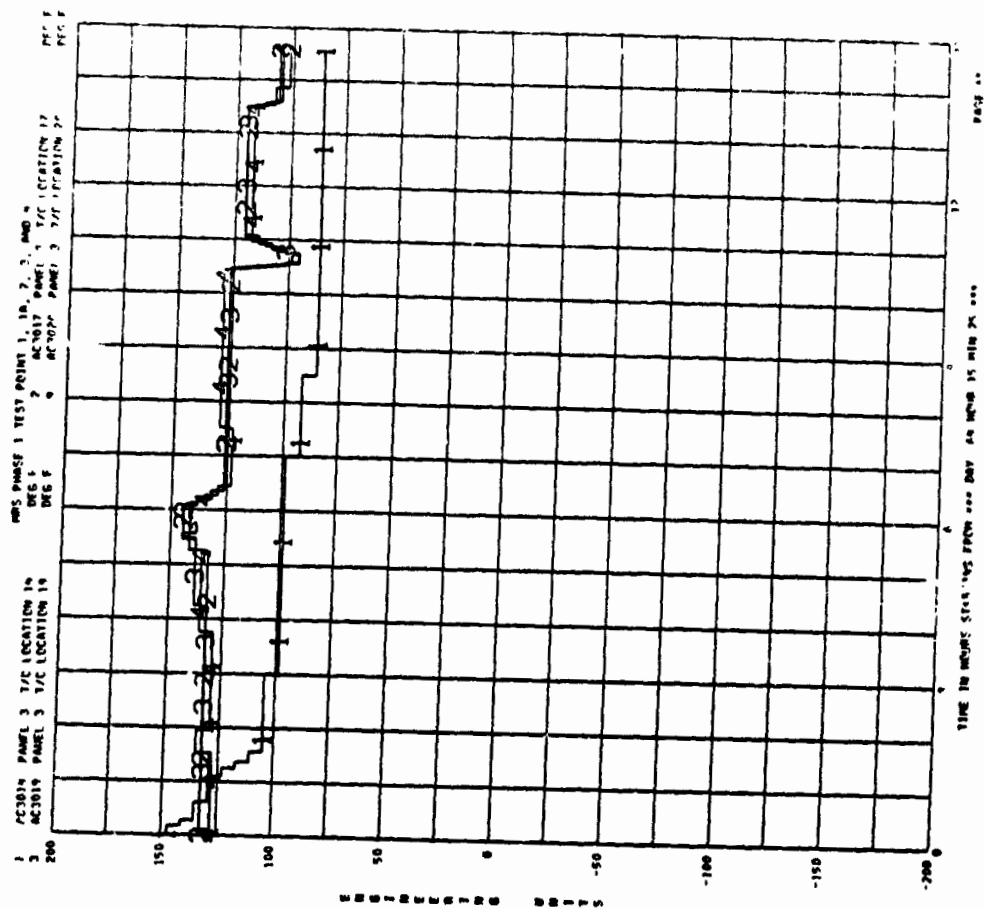
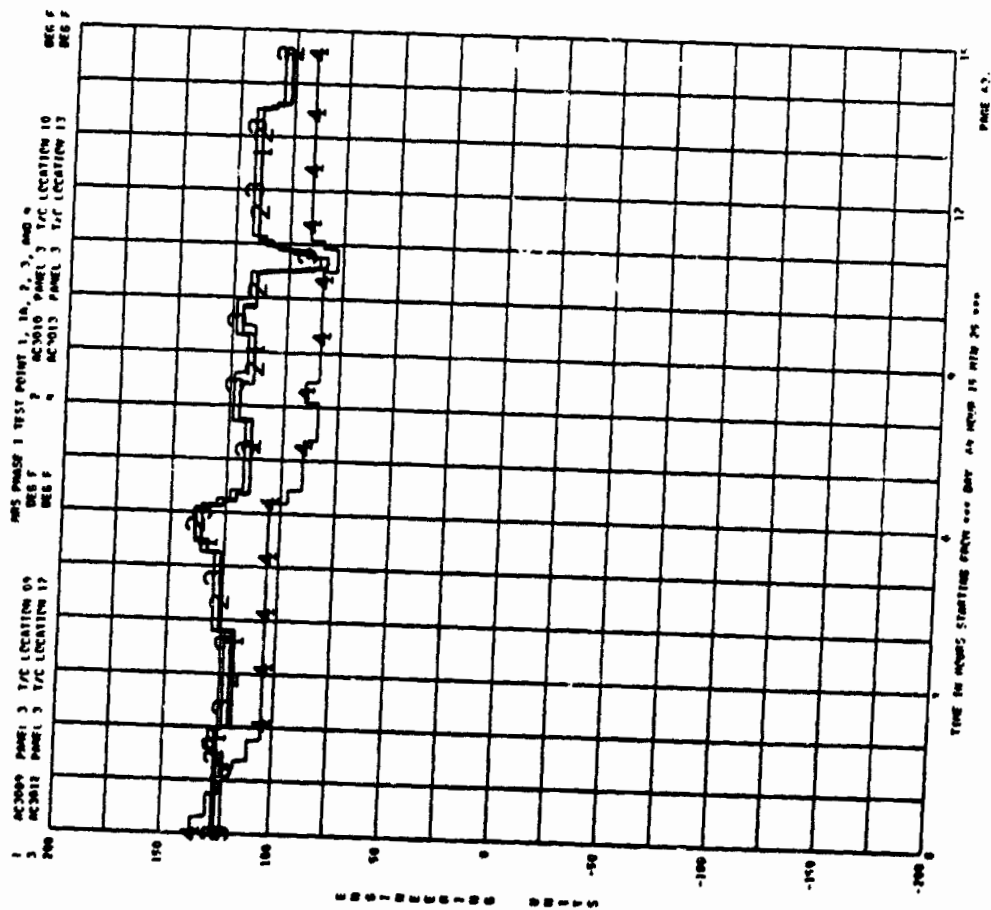


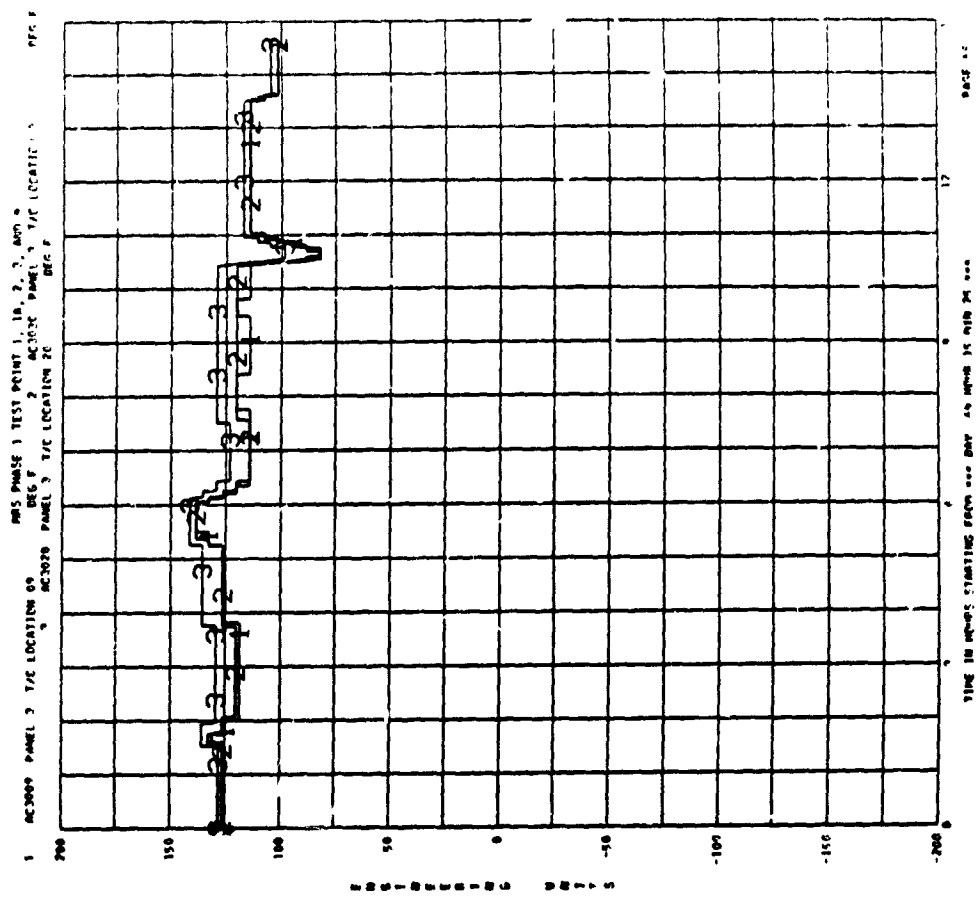
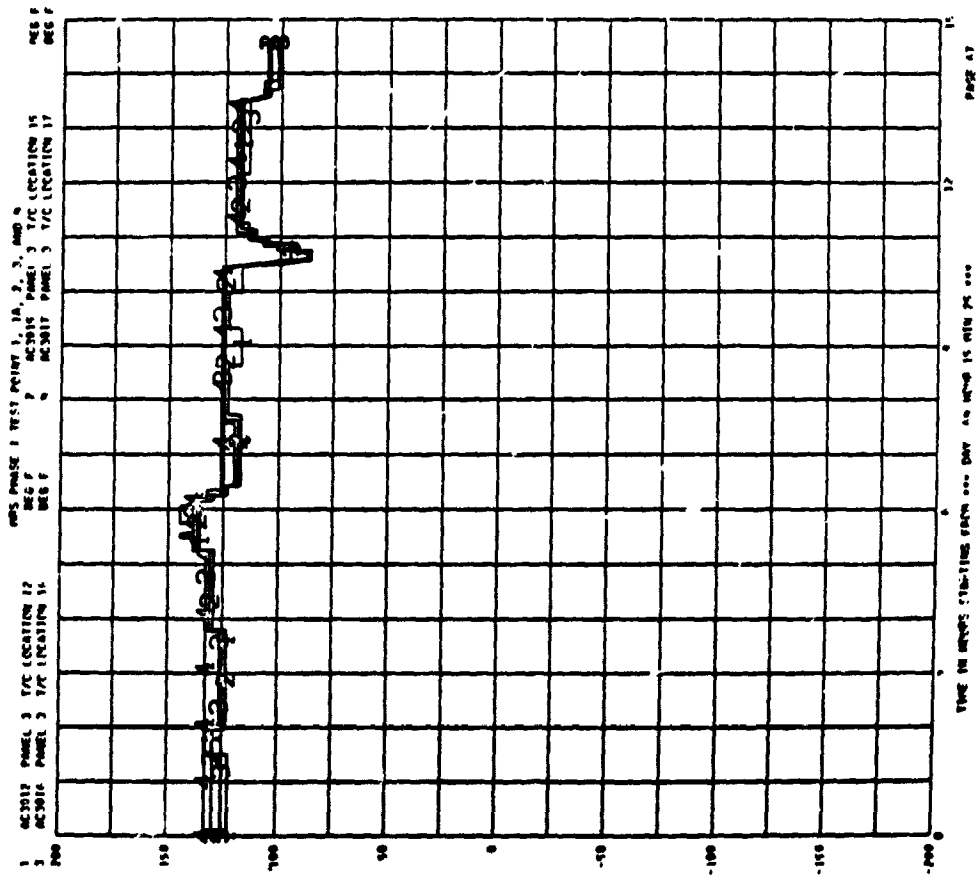


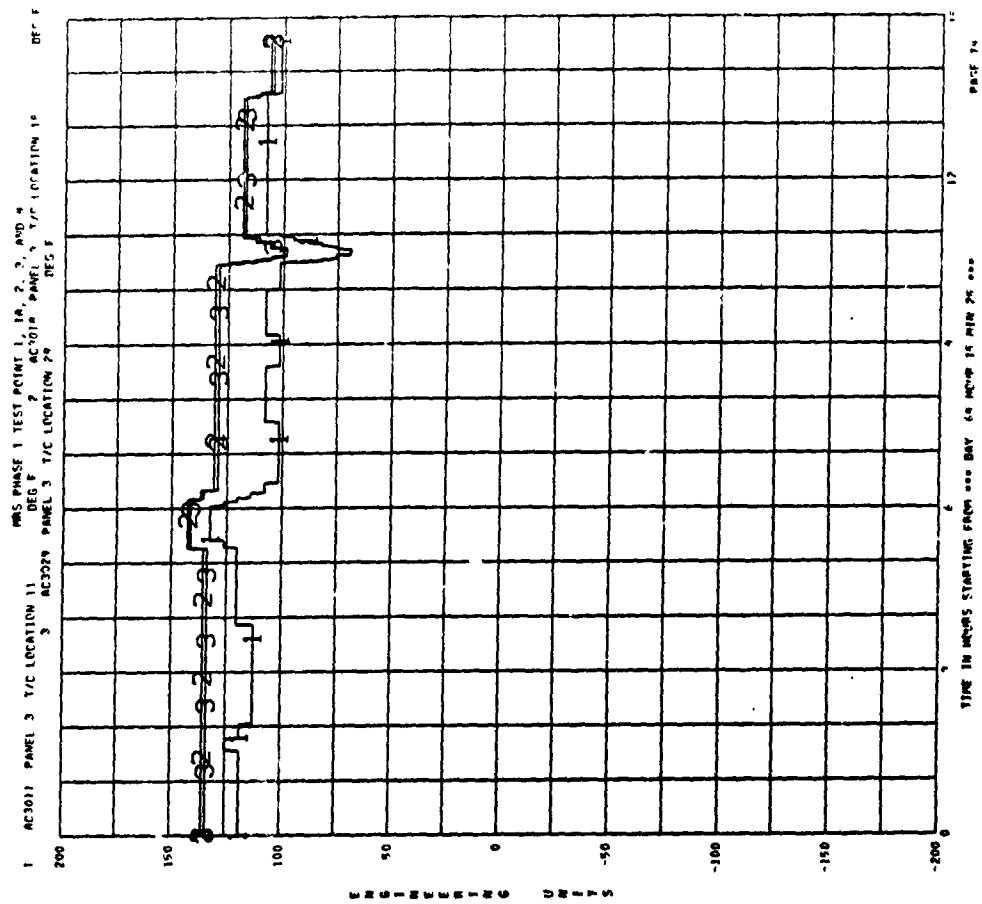
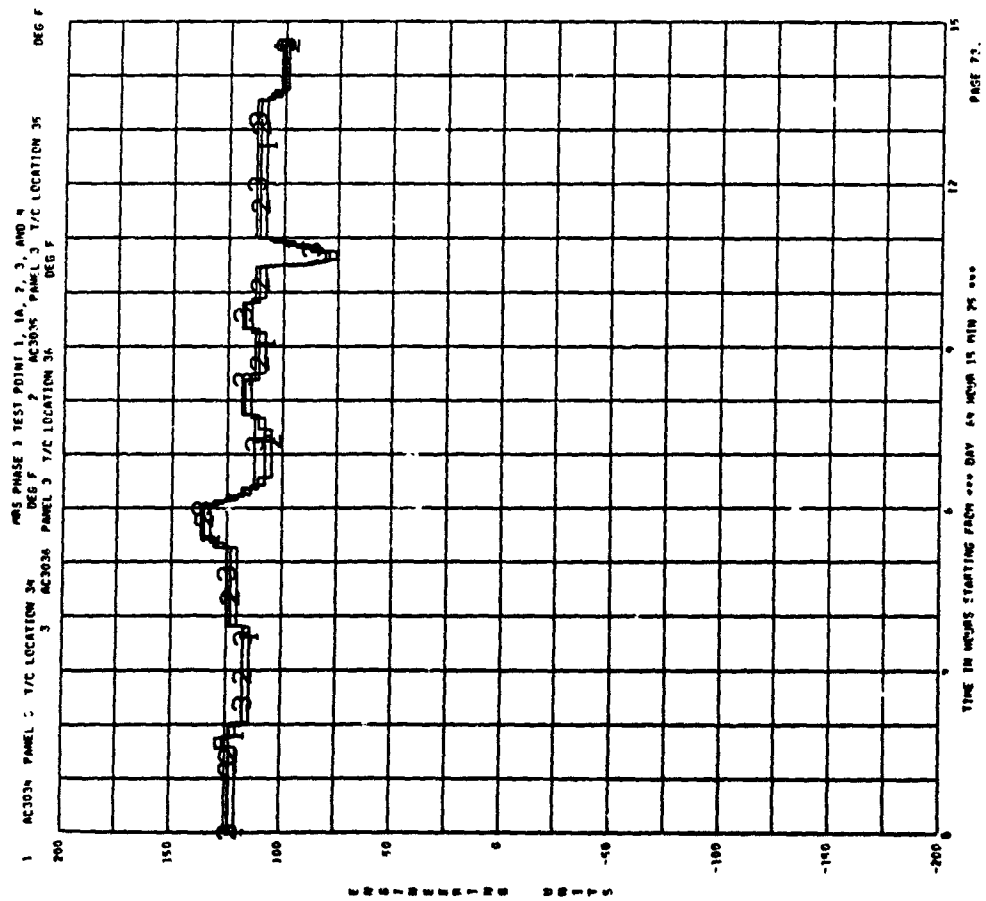


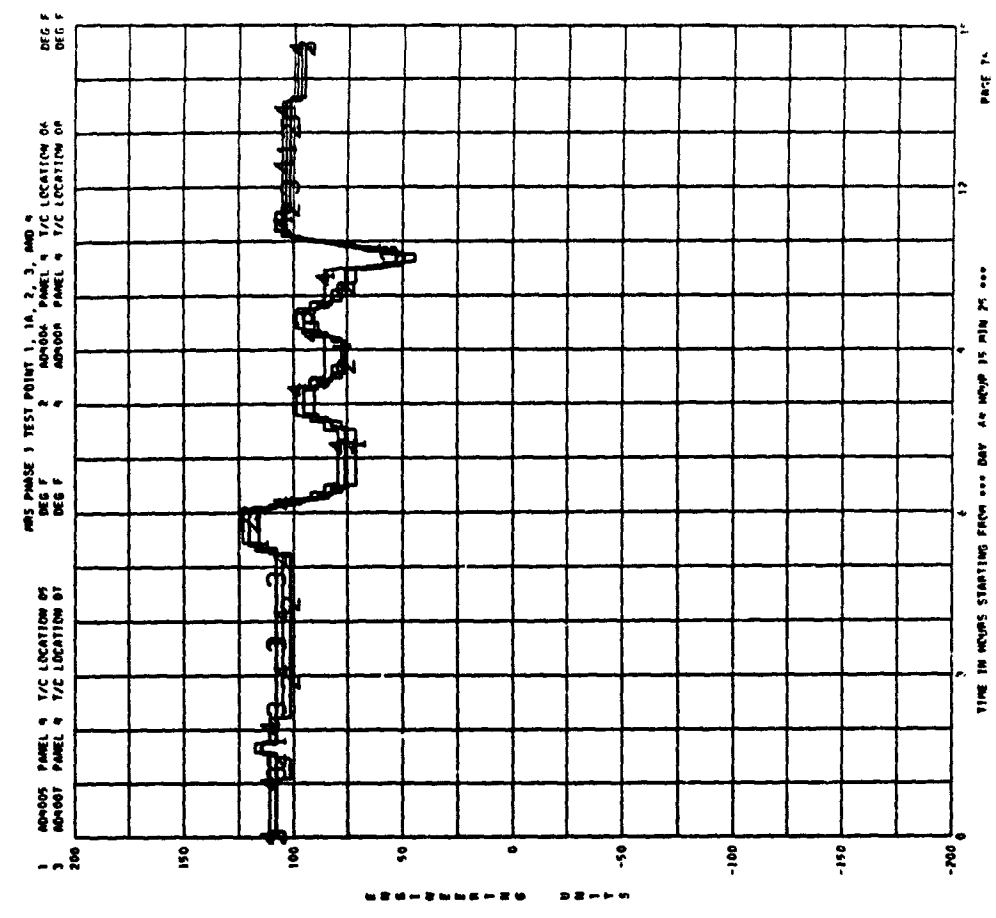
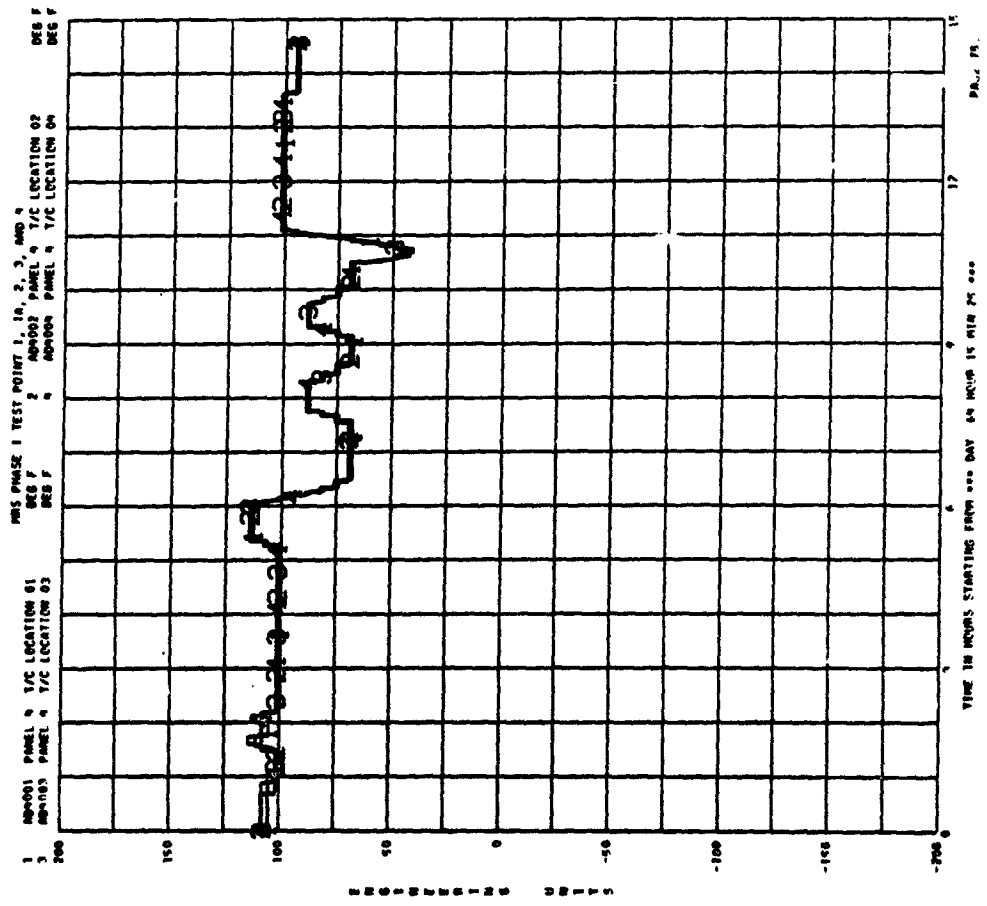


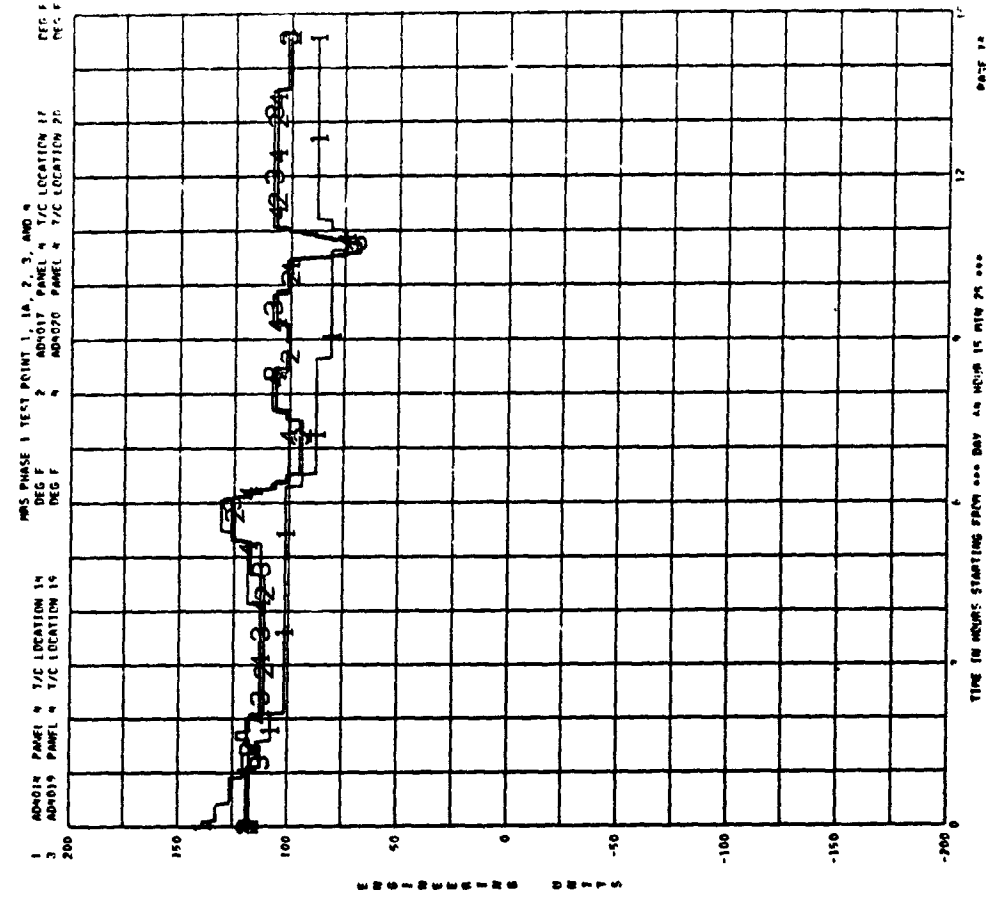
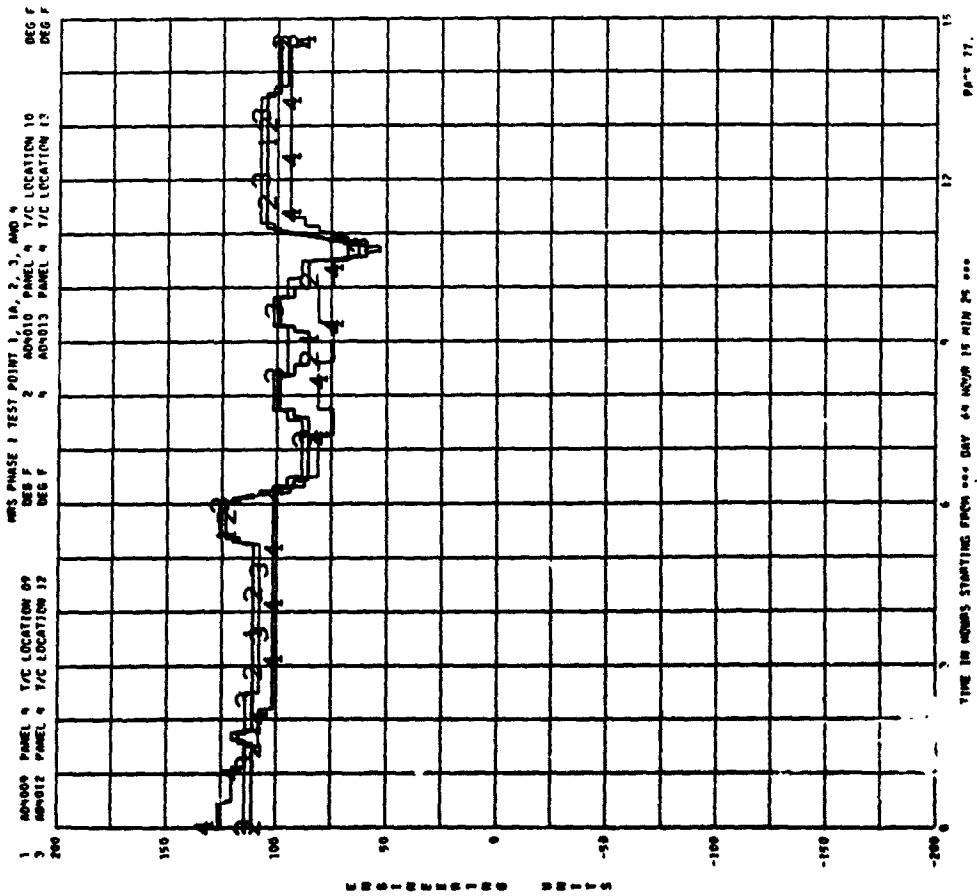


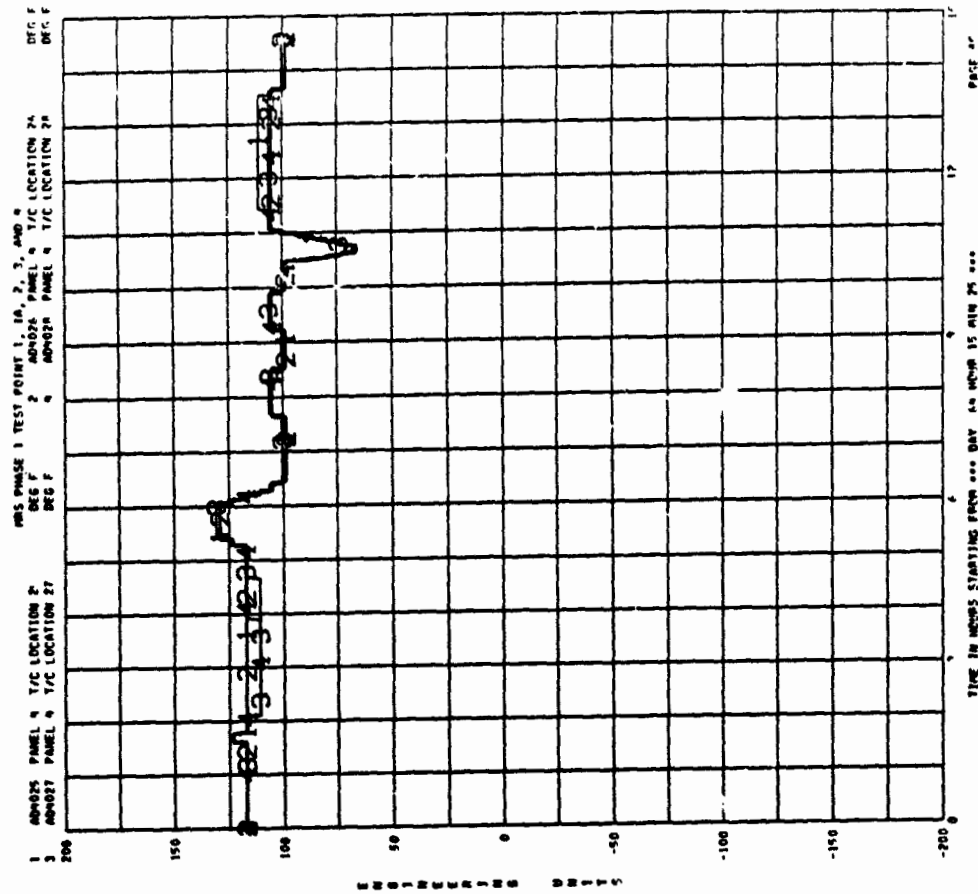
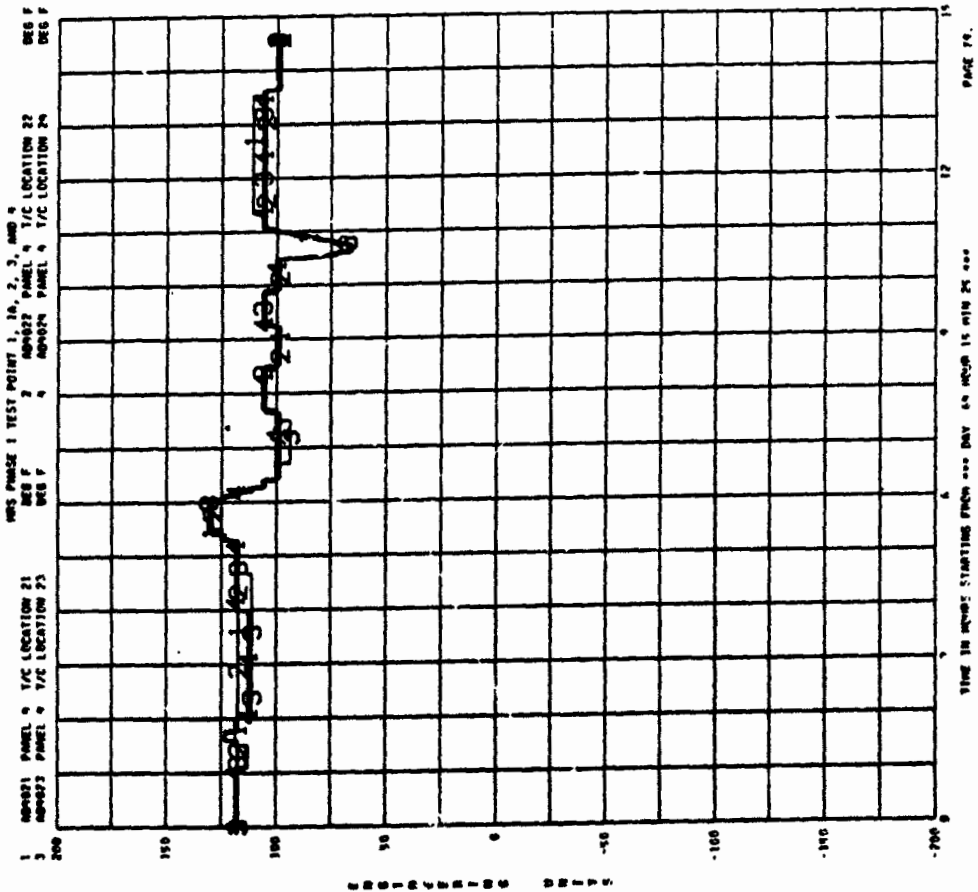


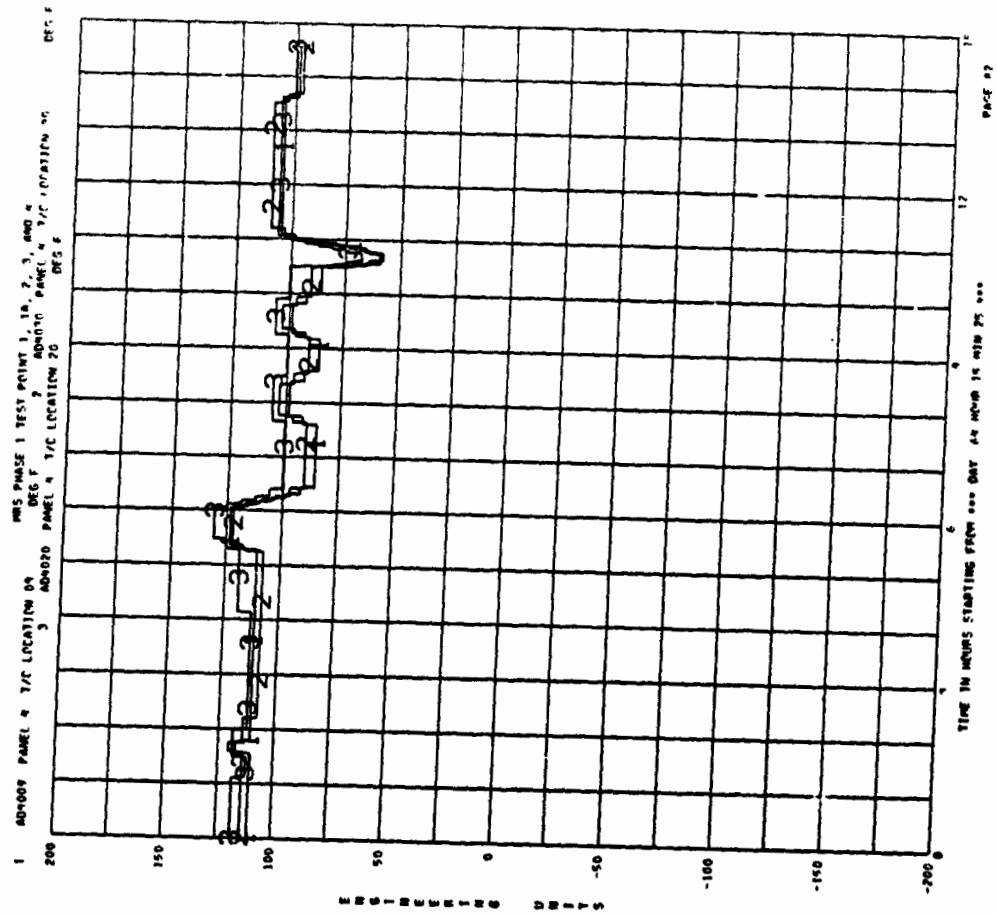
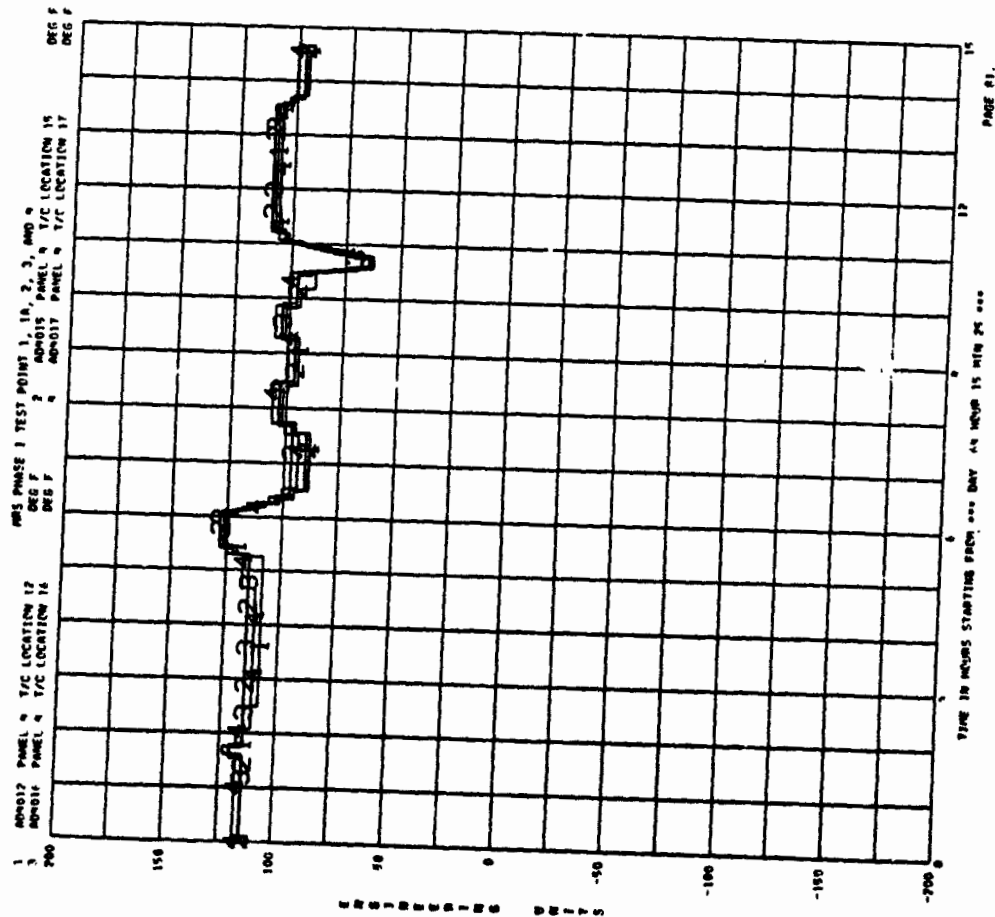


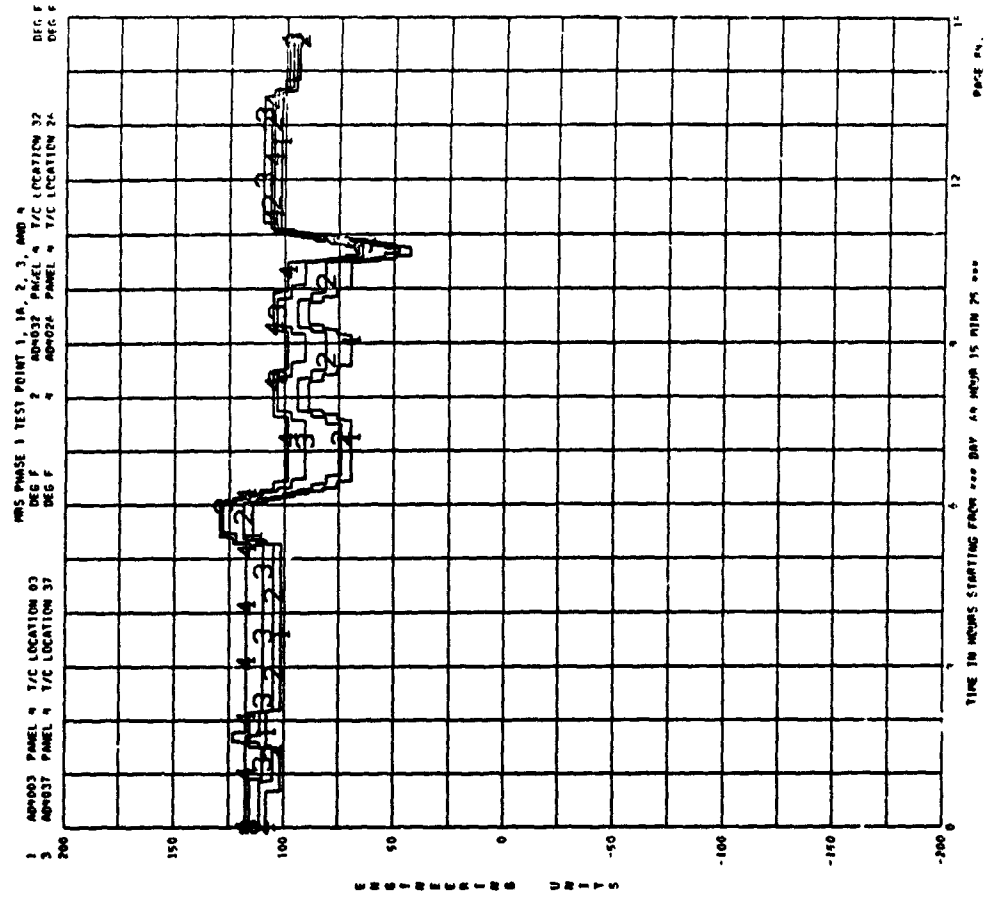
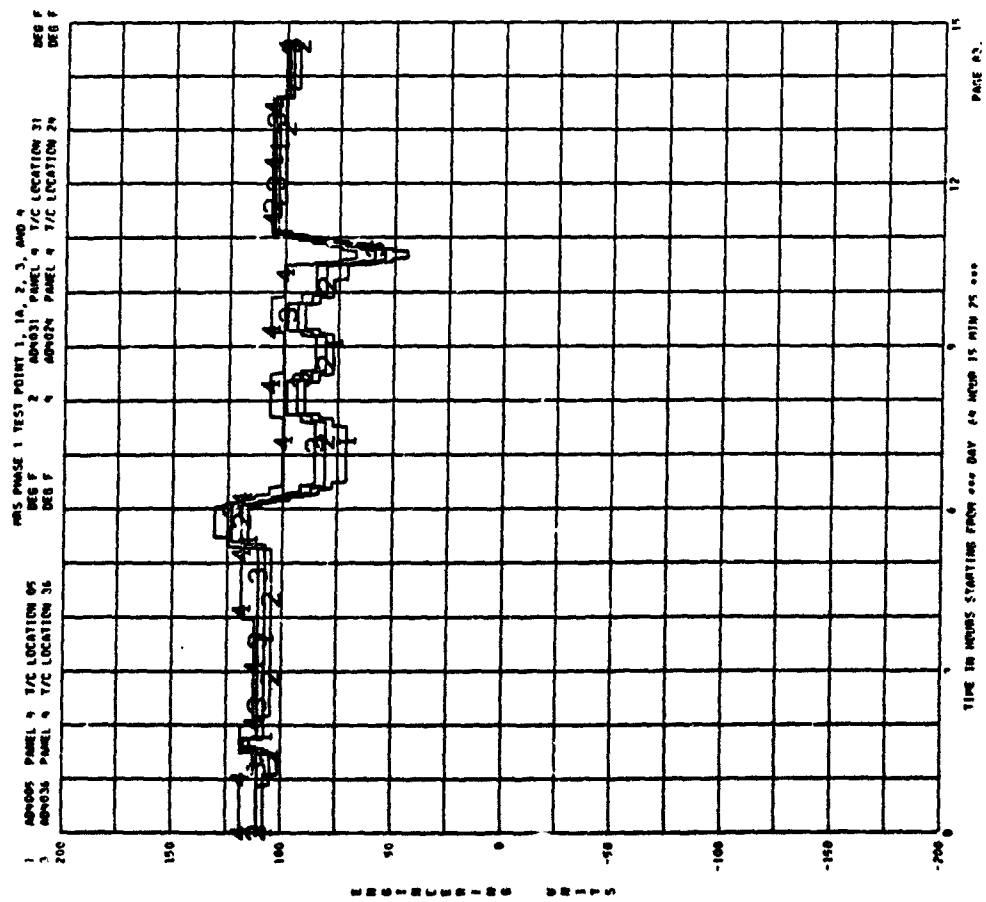


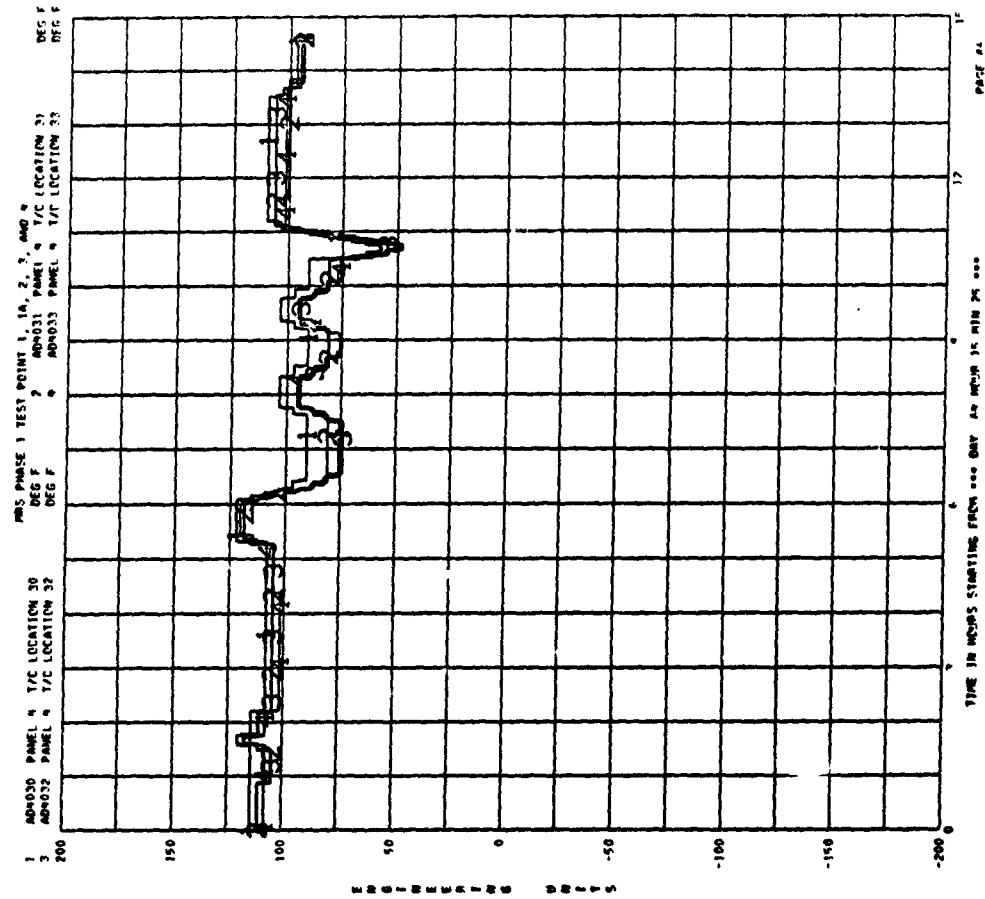
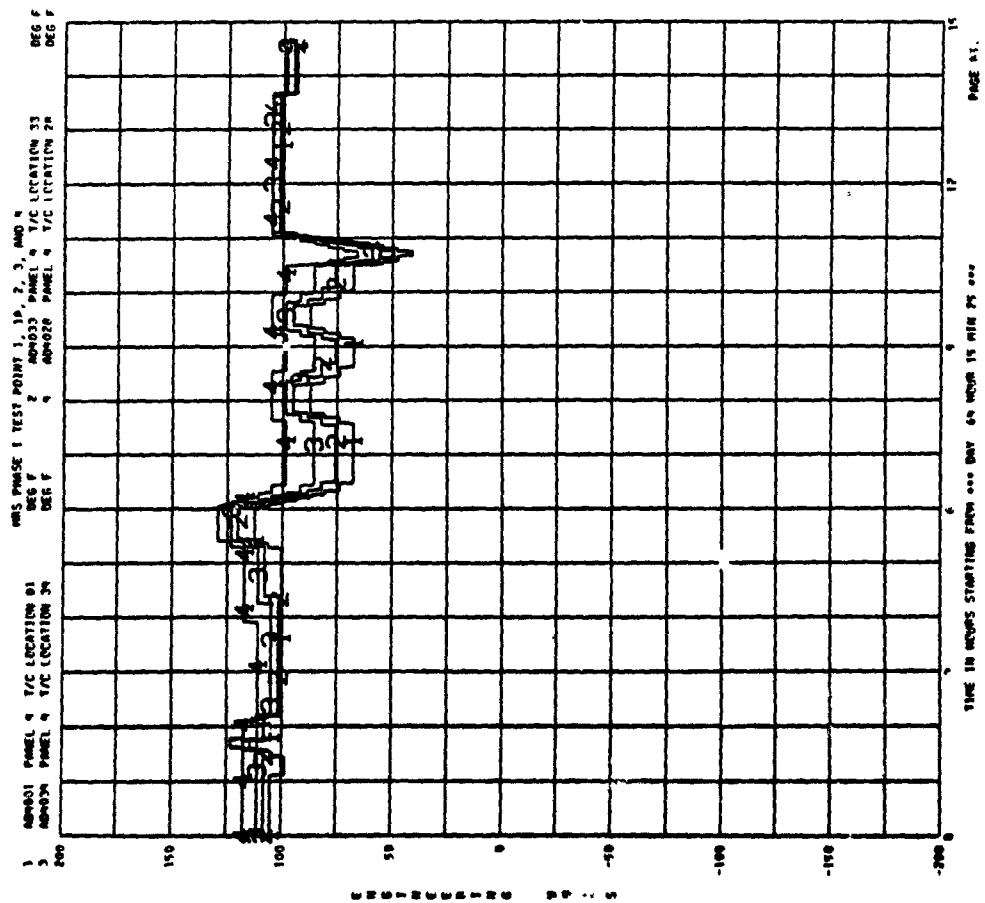


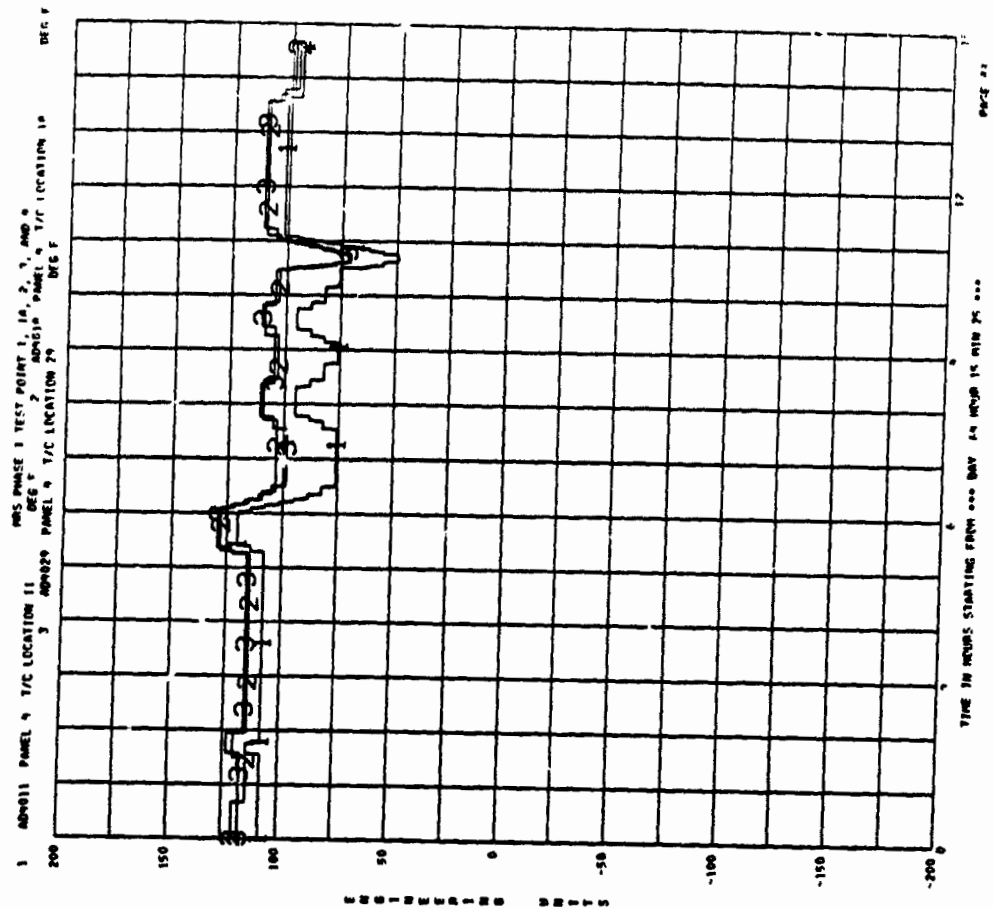
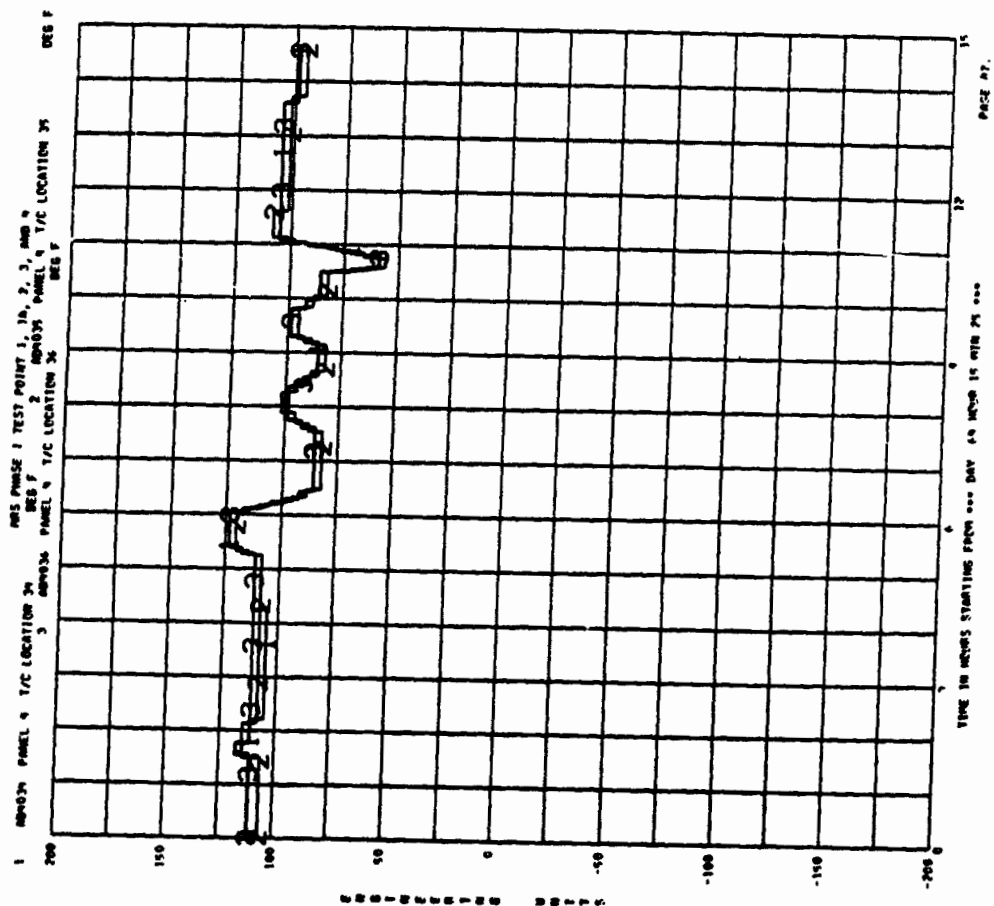


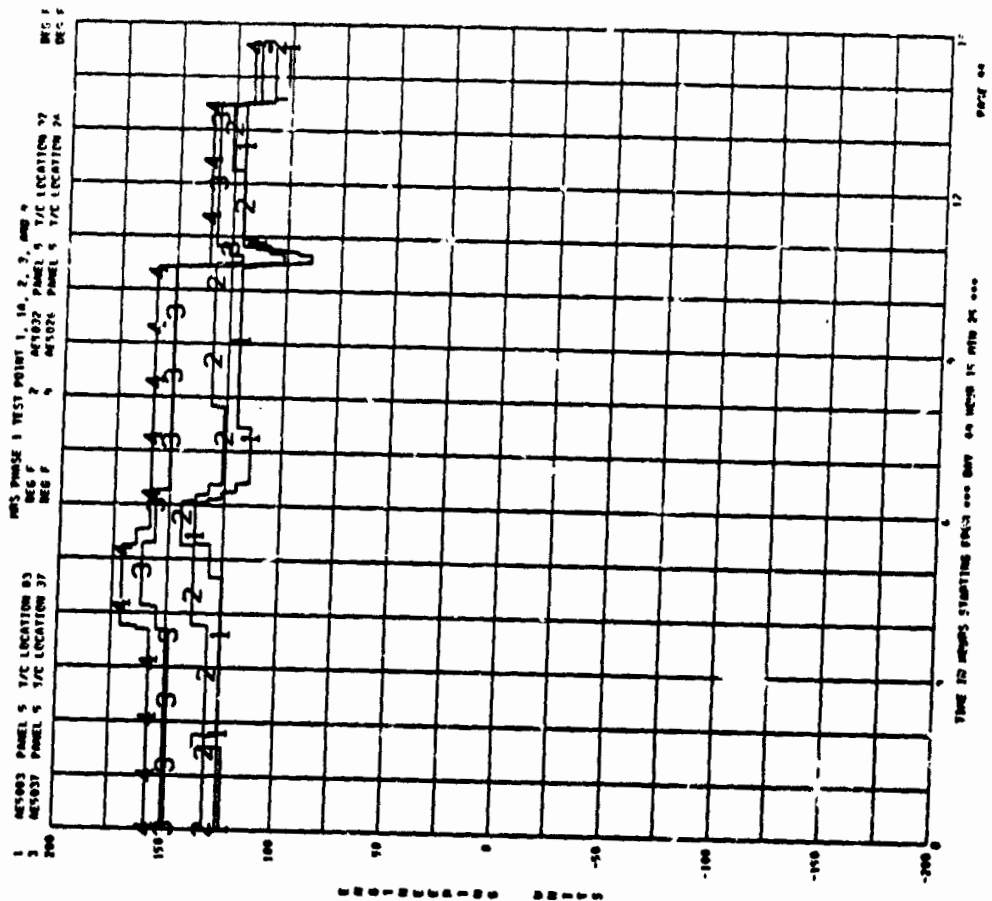
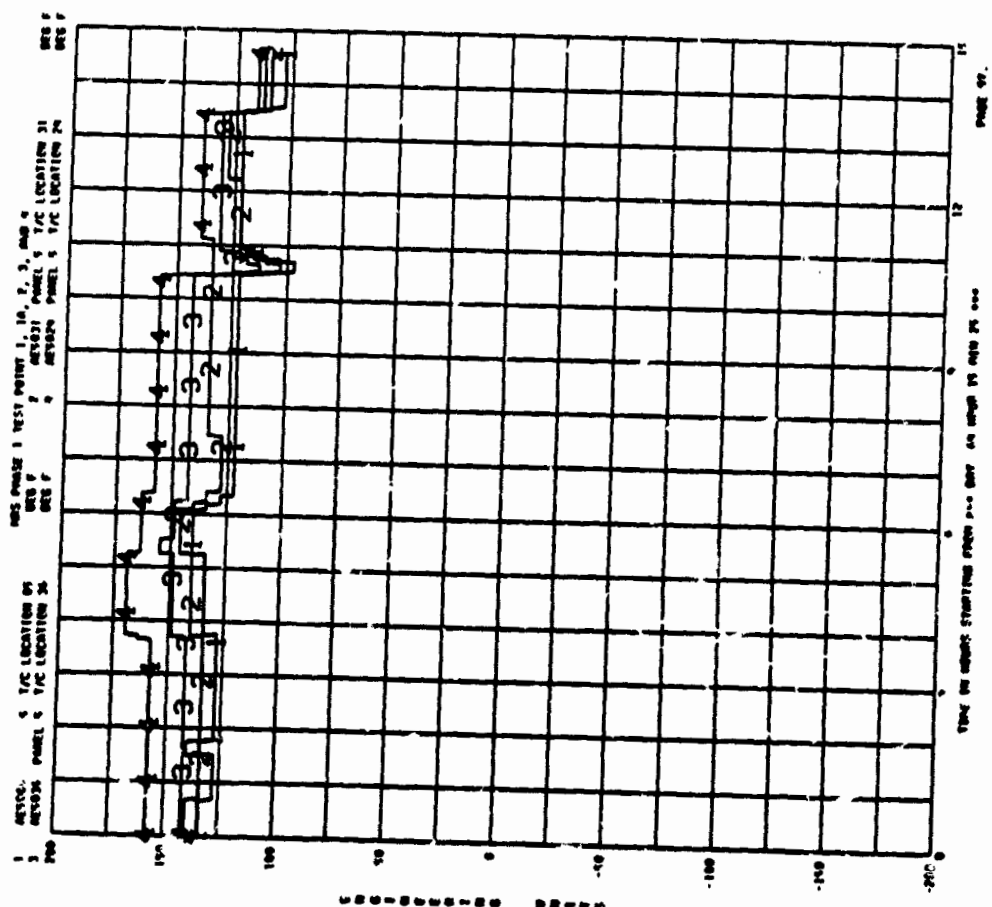


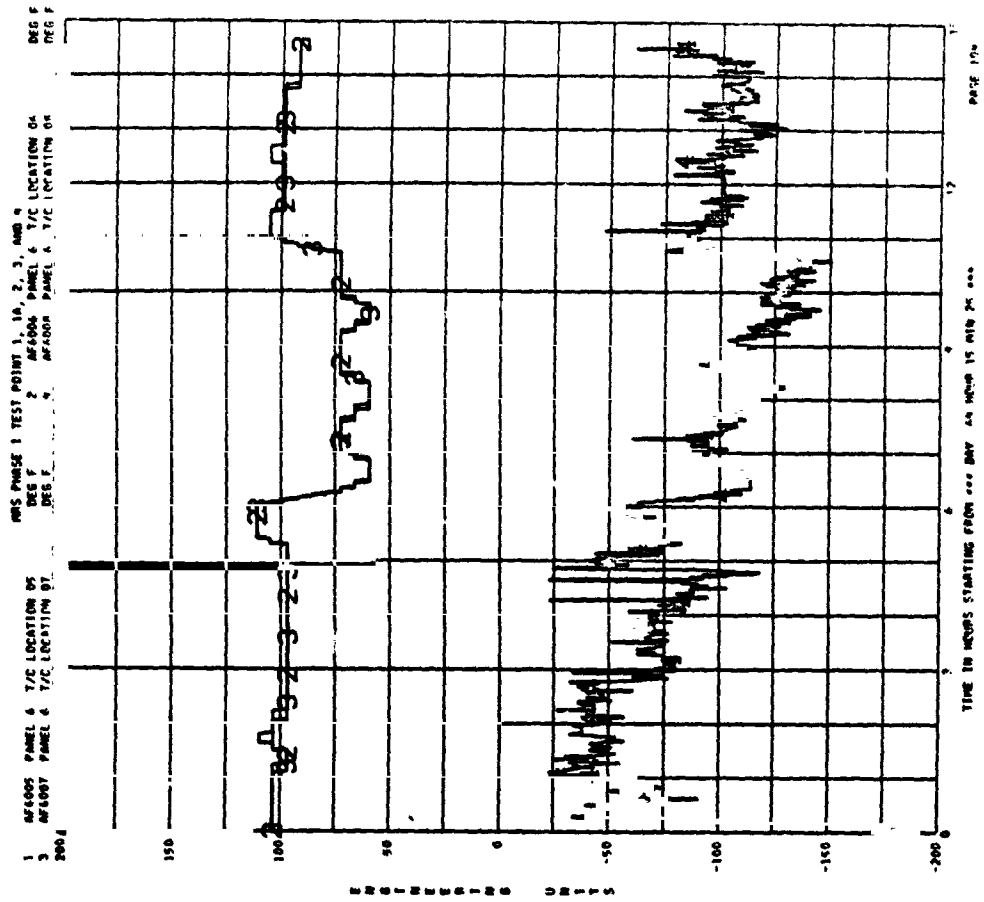
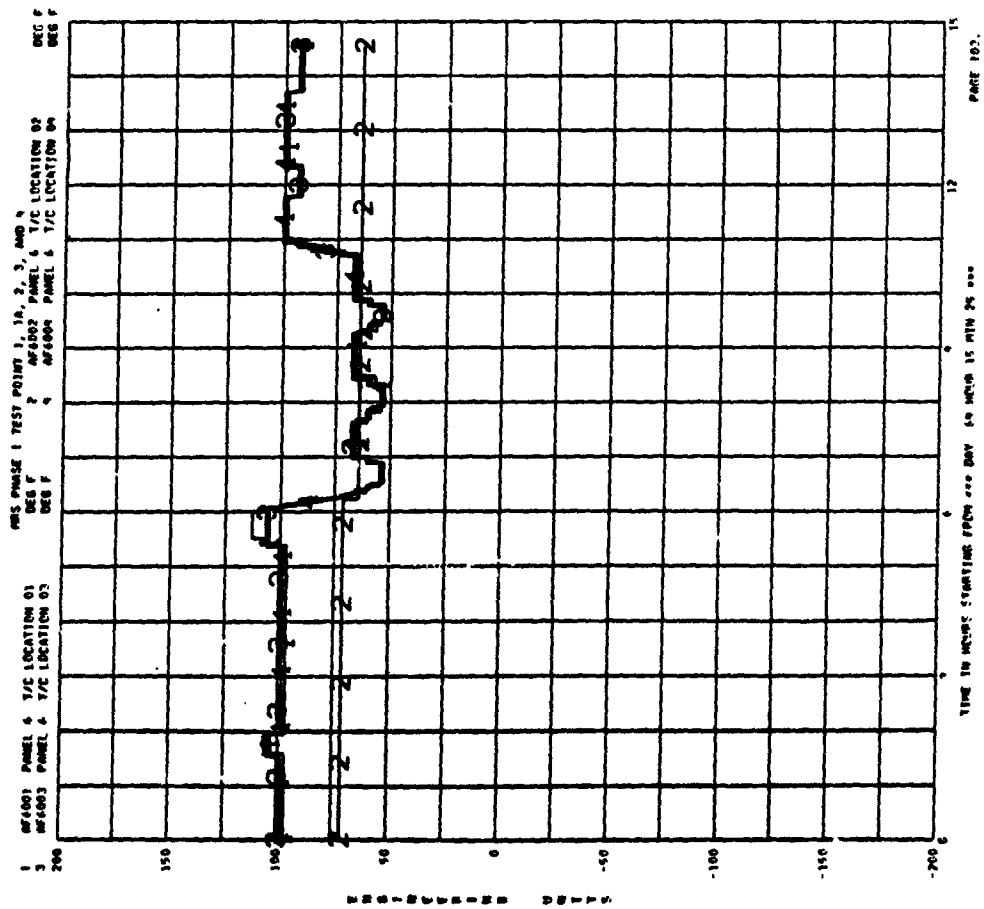


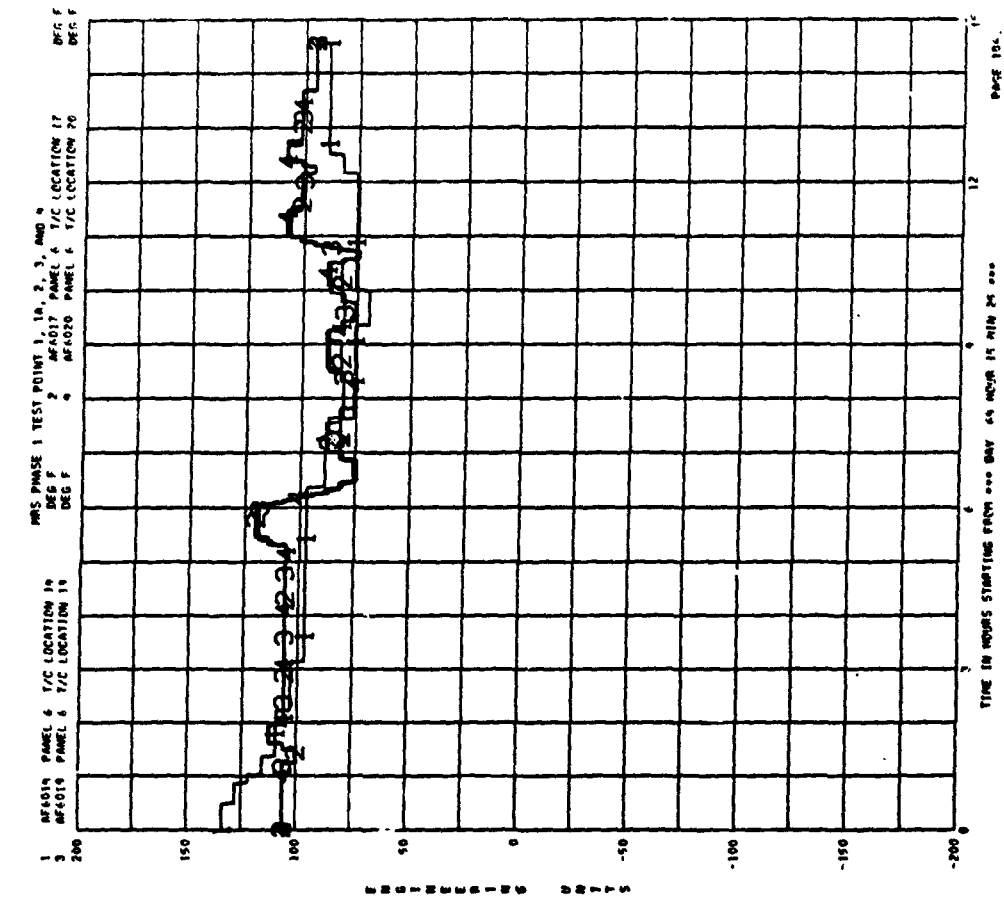
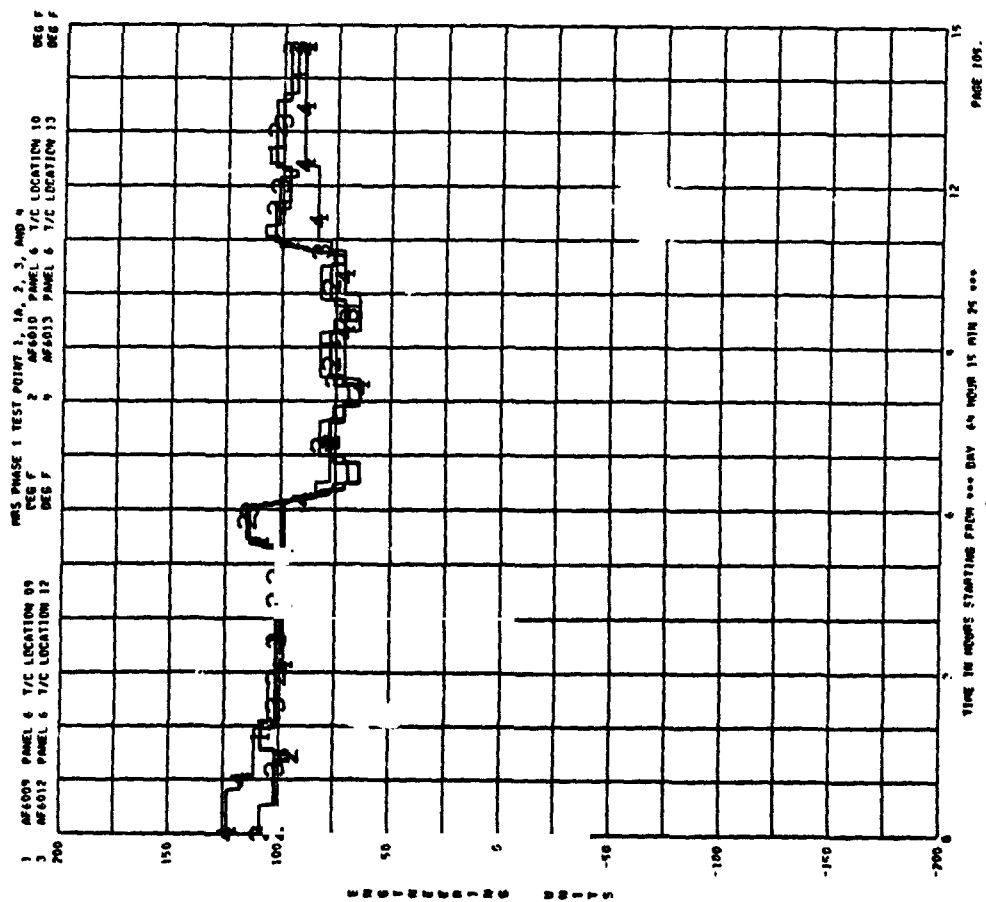


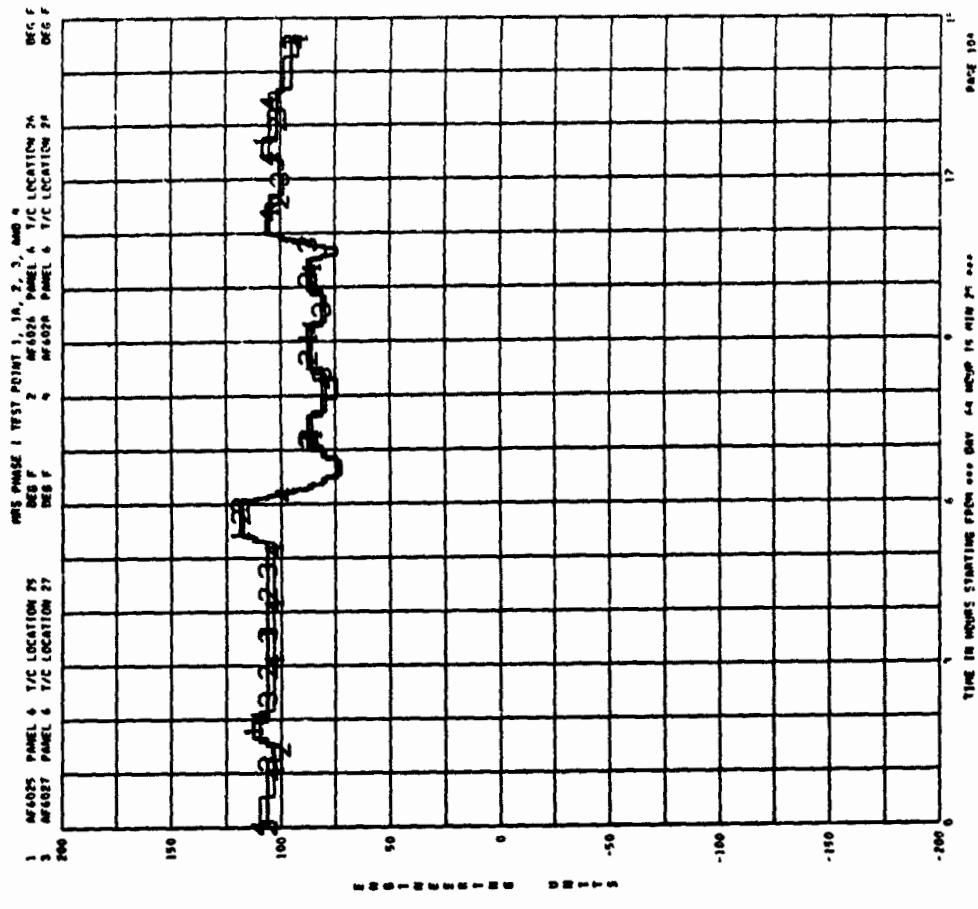
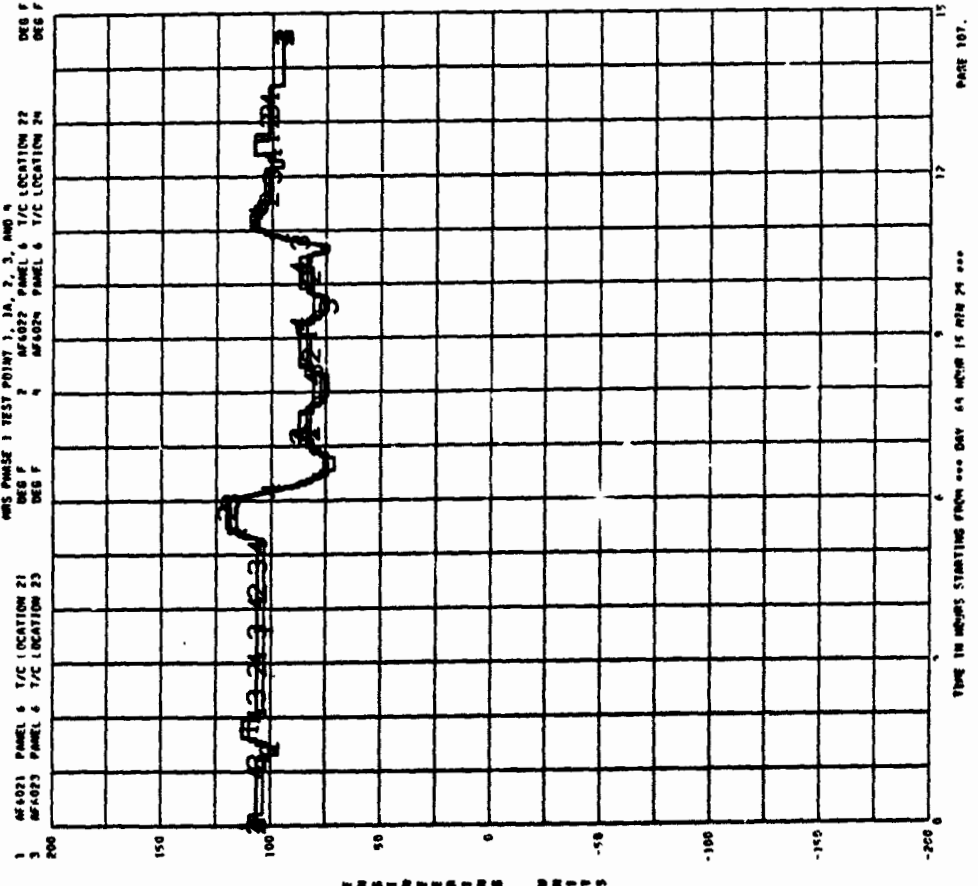


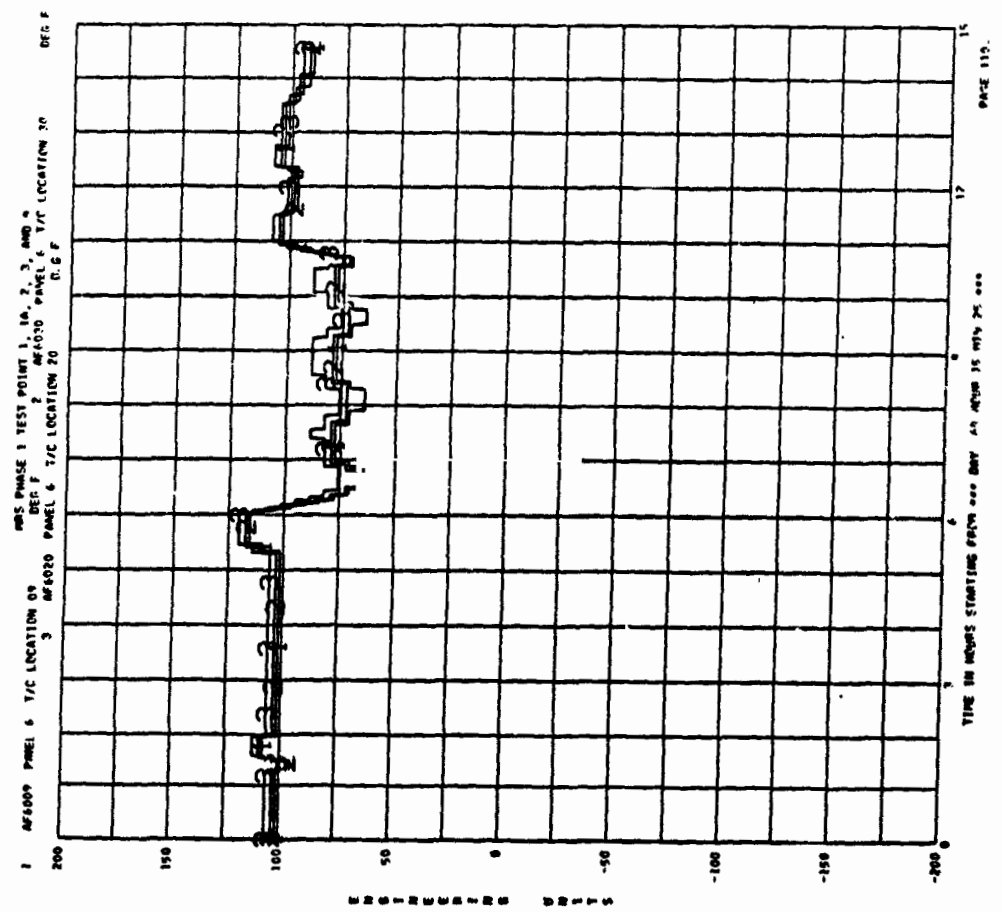
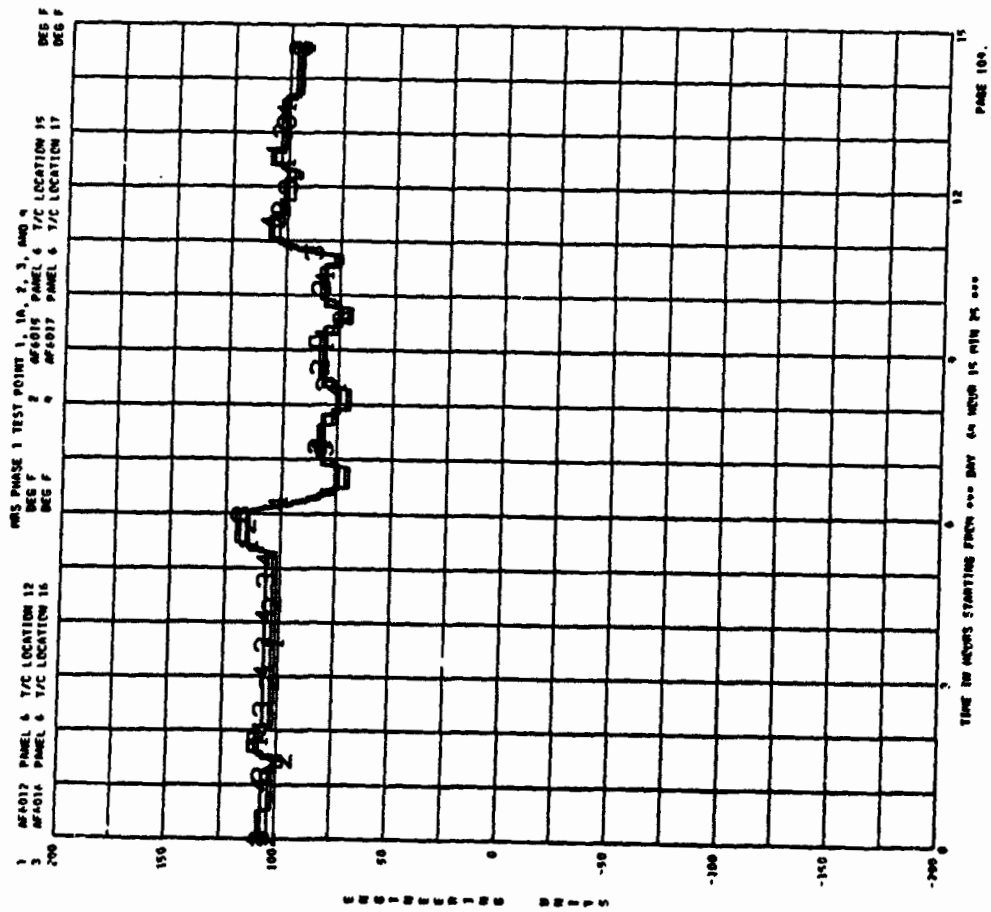


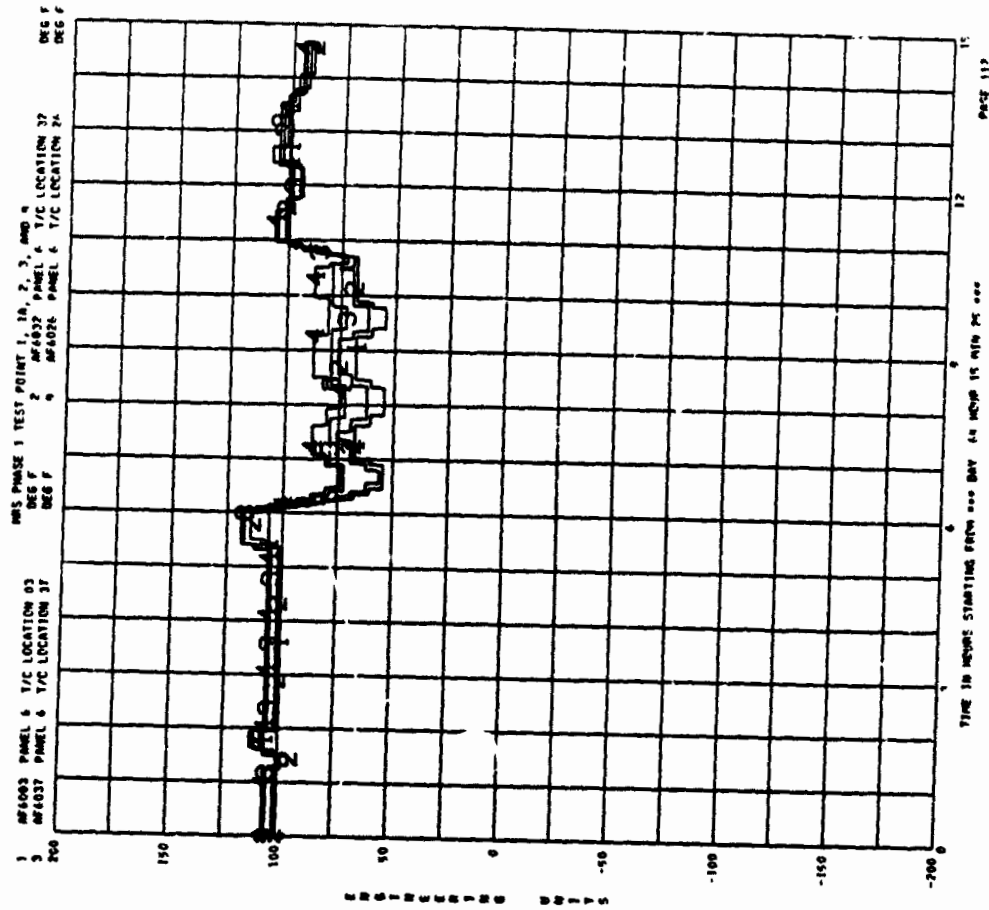
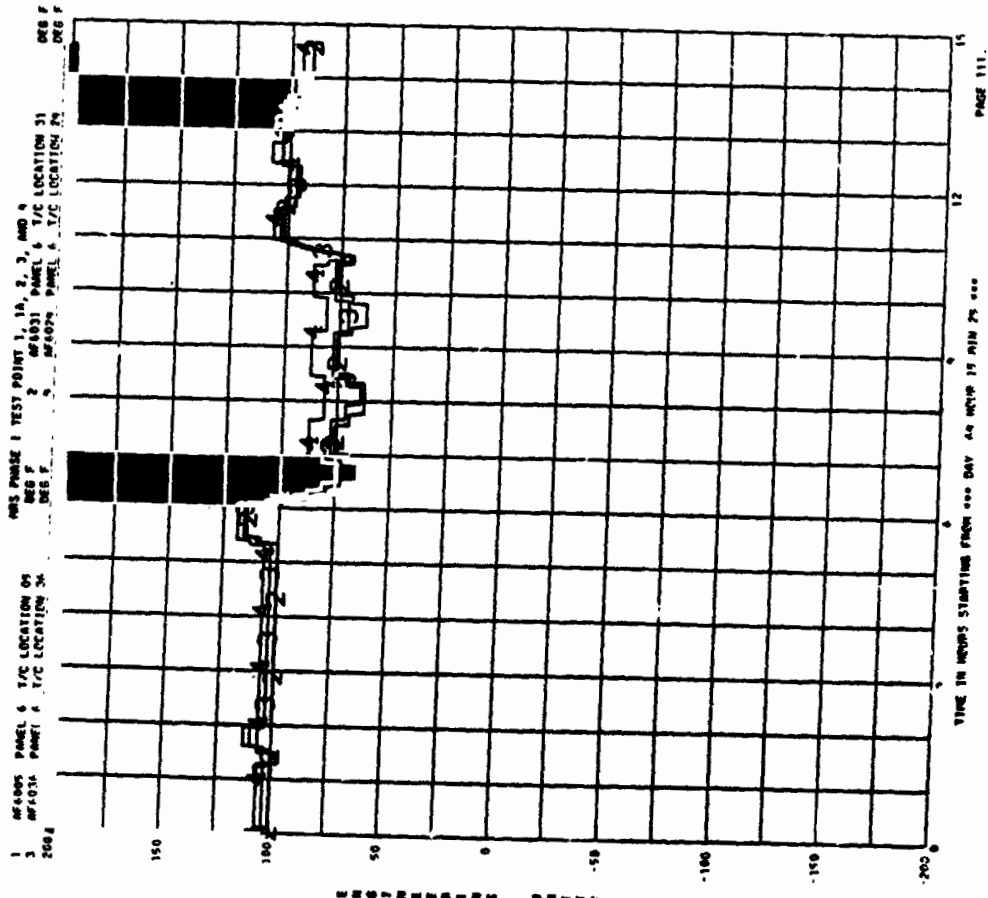


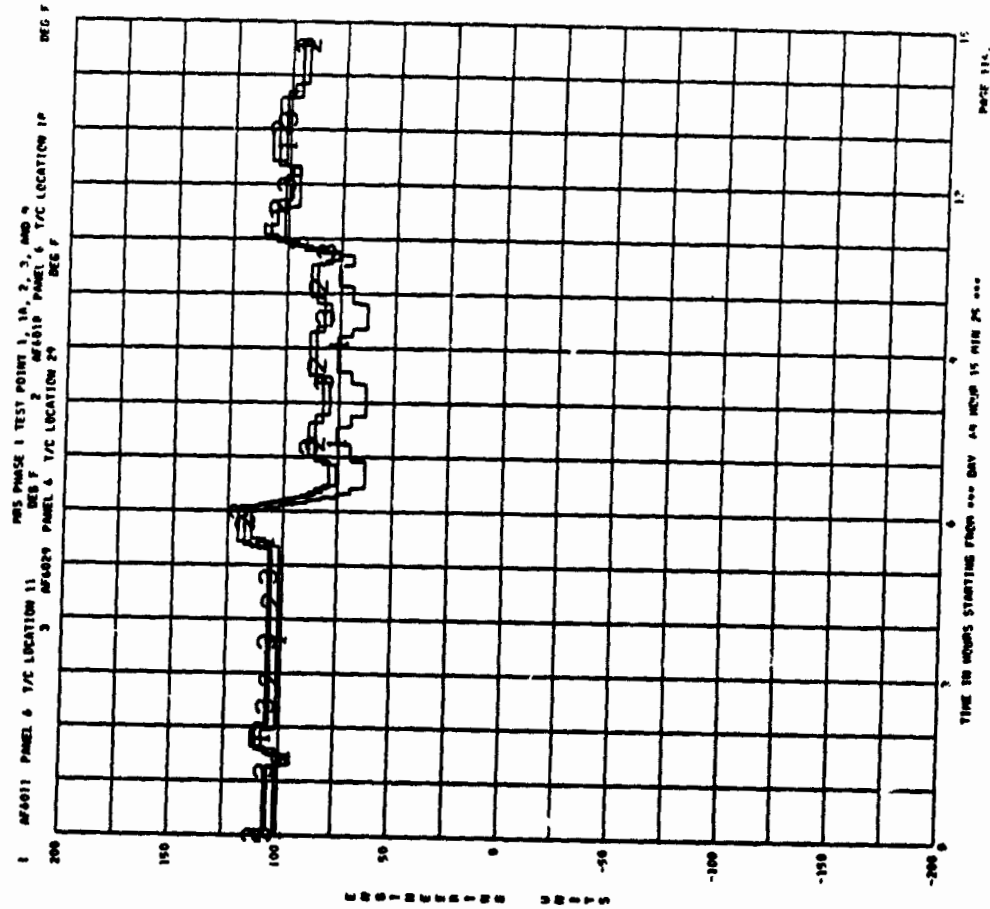
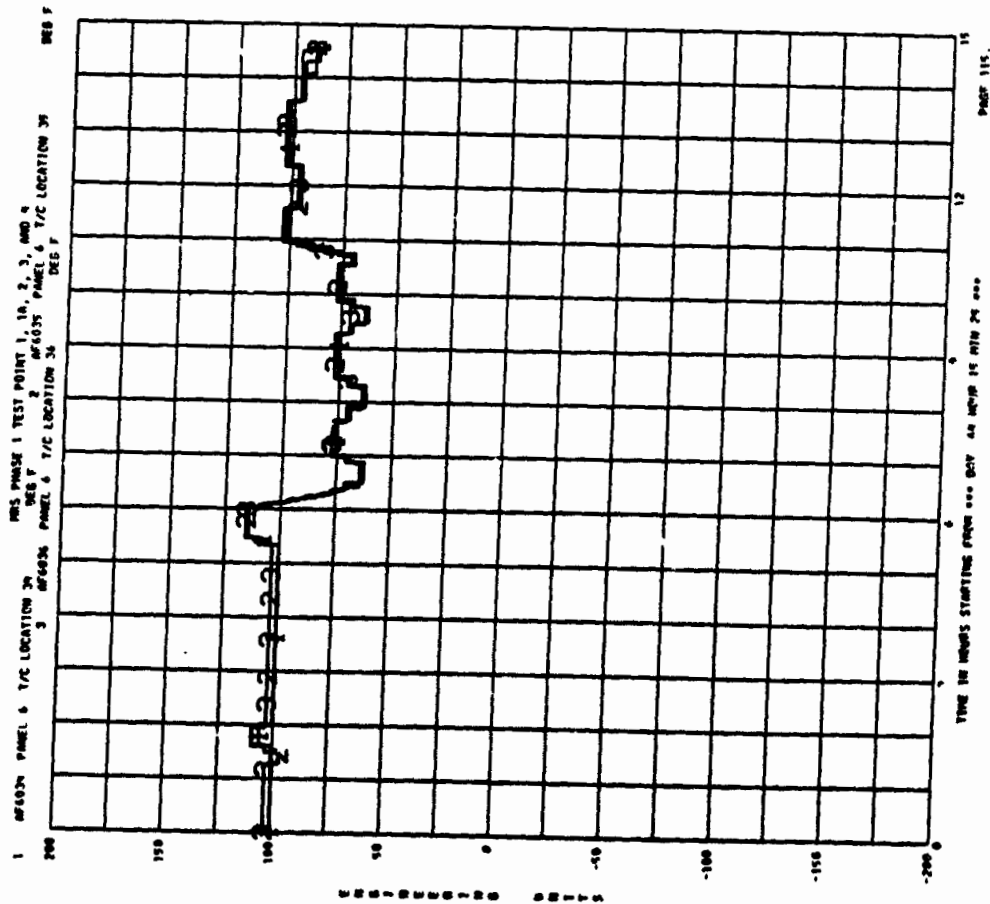


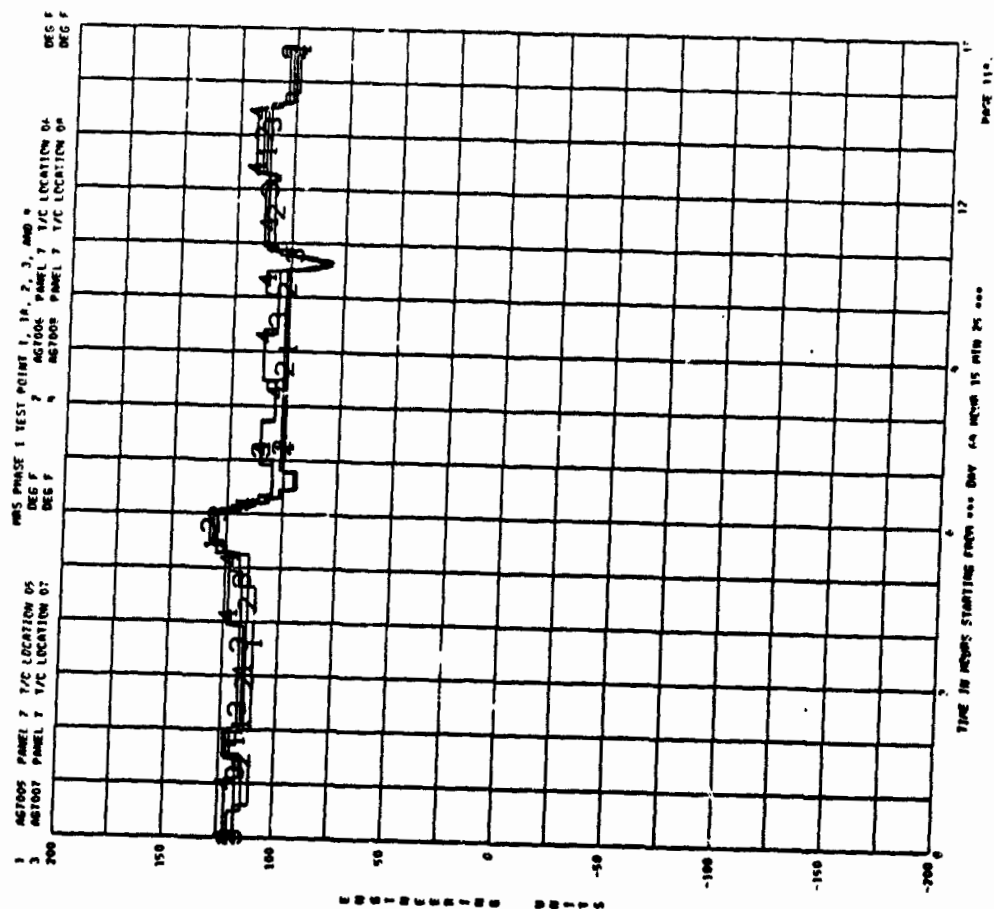
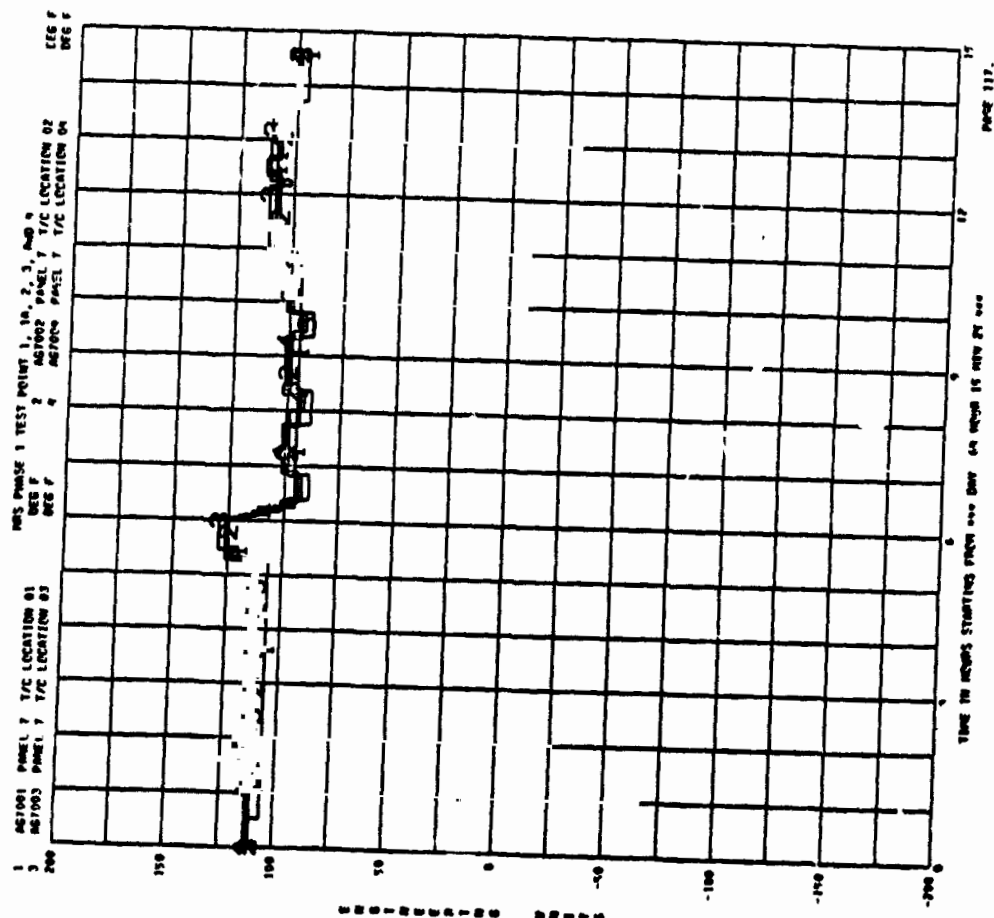








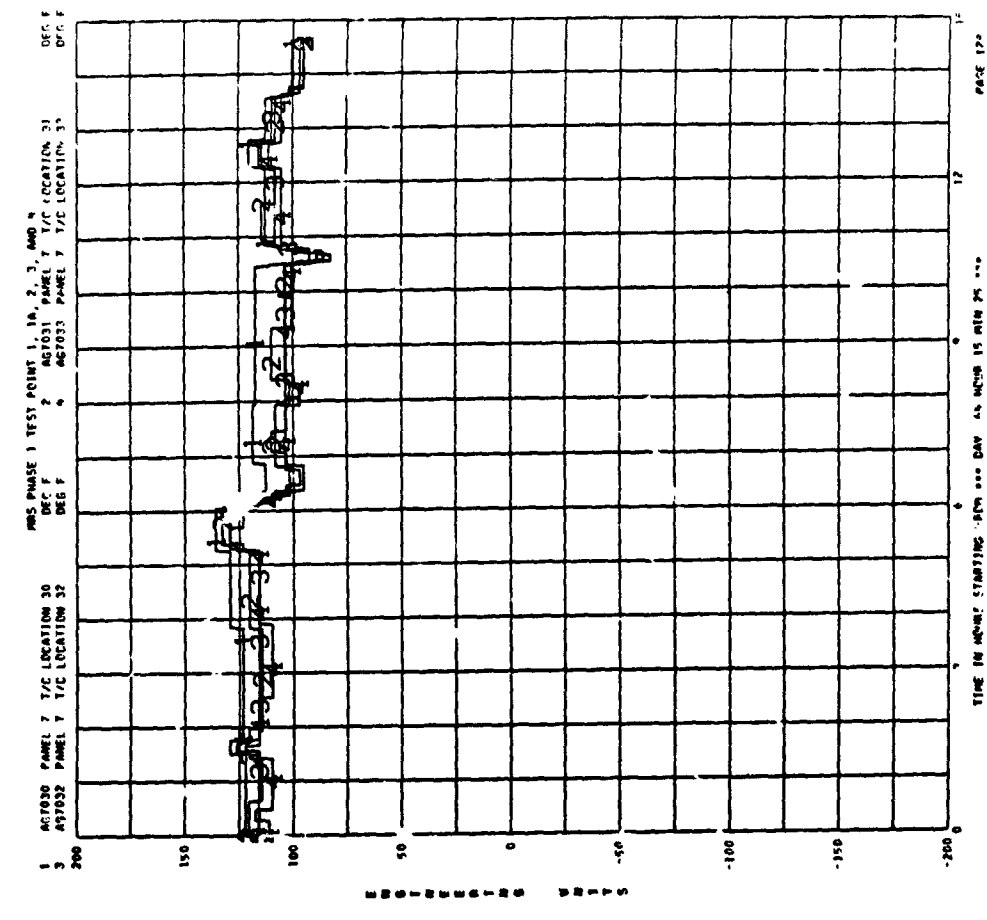
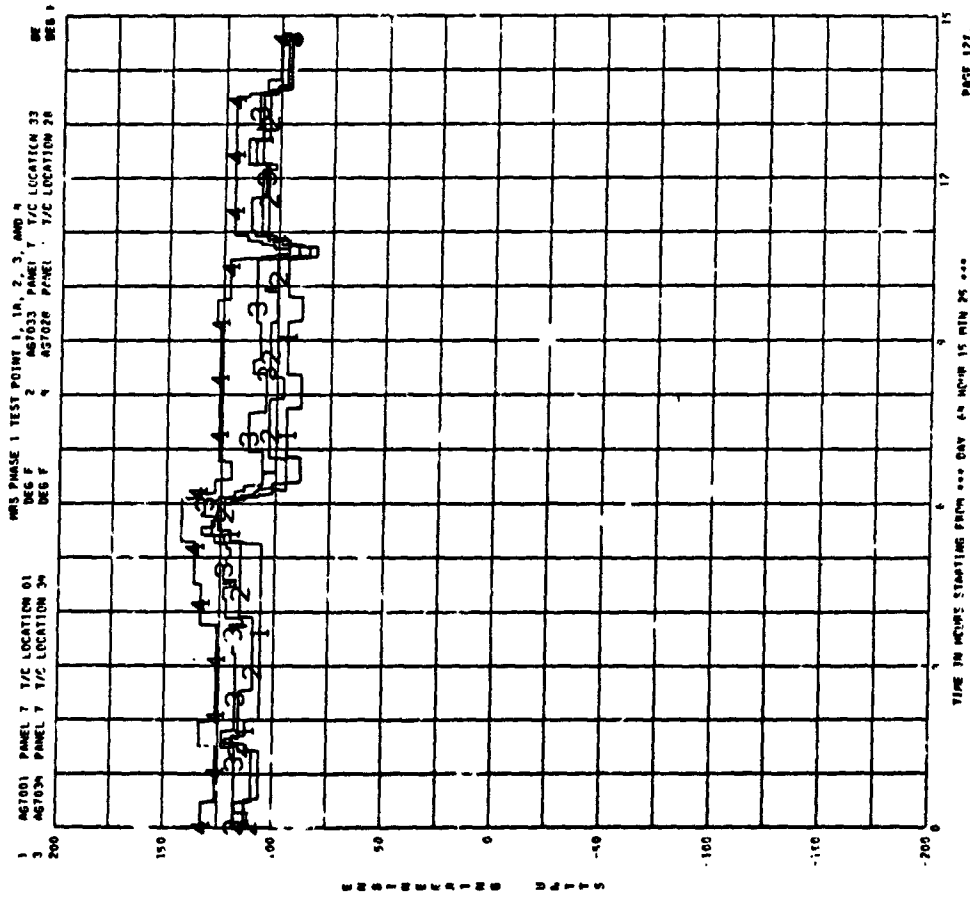




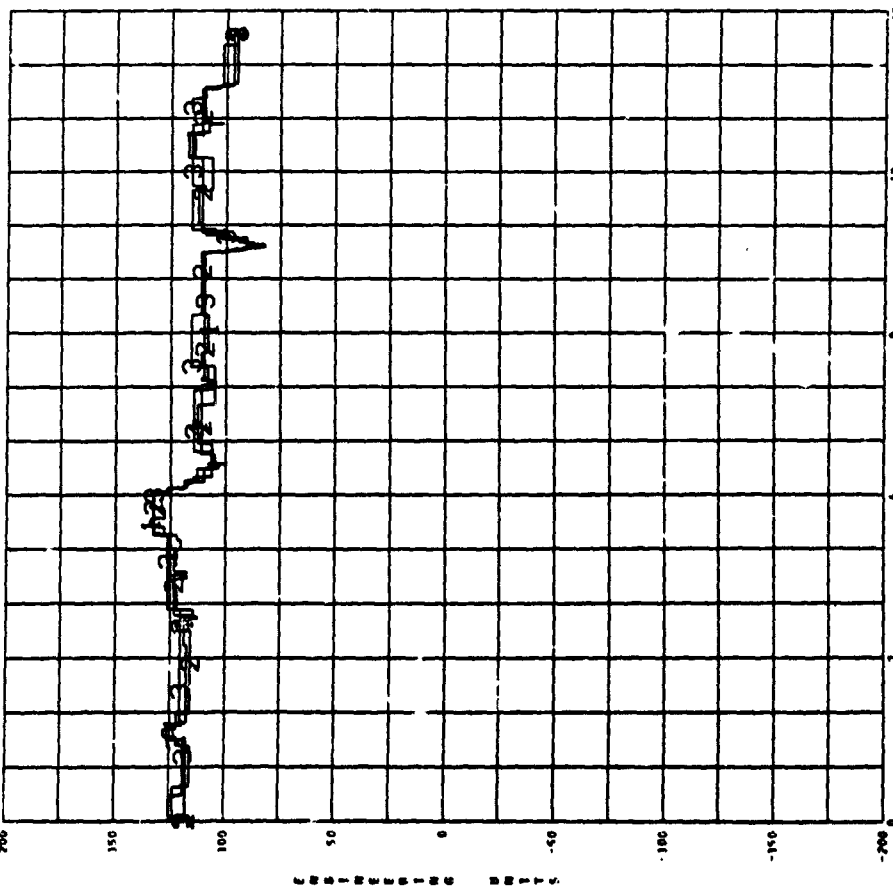
Page 123.

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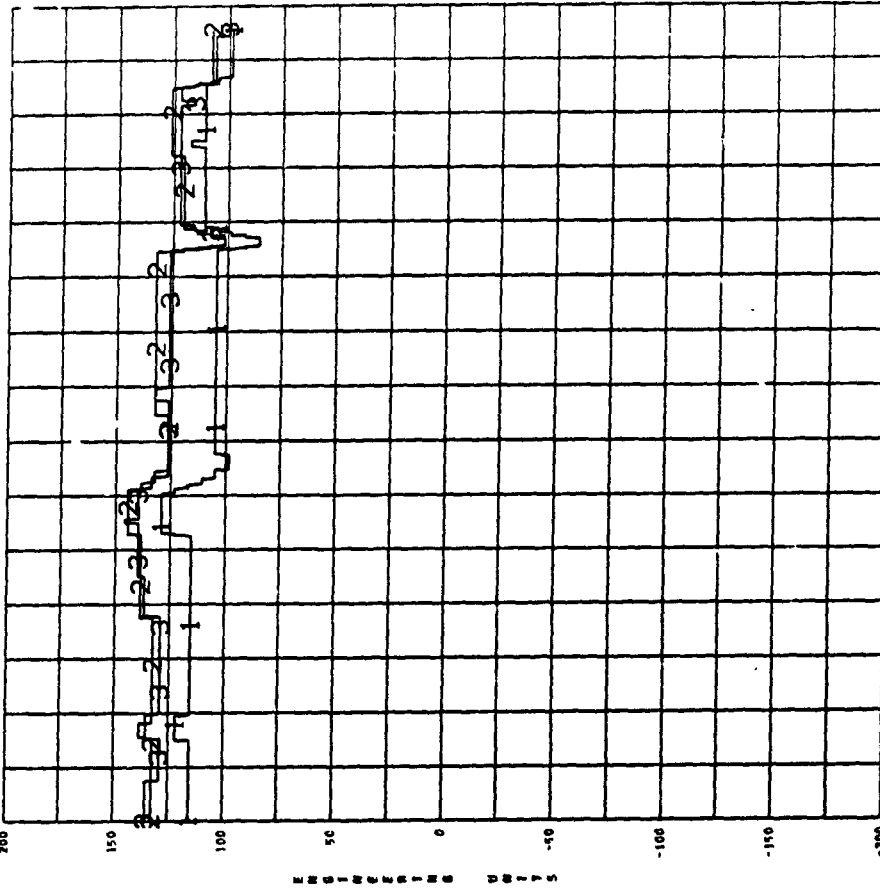
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 66 AG7099 PANEL 7 T/C LOCATION 99
 70 AG7100 PANEL 7 T/C LOCATION 100



TIME IN HOURS STARTING FROM 0000 HRS
 0000 HRS
 0100 HRS
 0200 HRS
 0300 HRS
 0400 HRS
 0500 HRS
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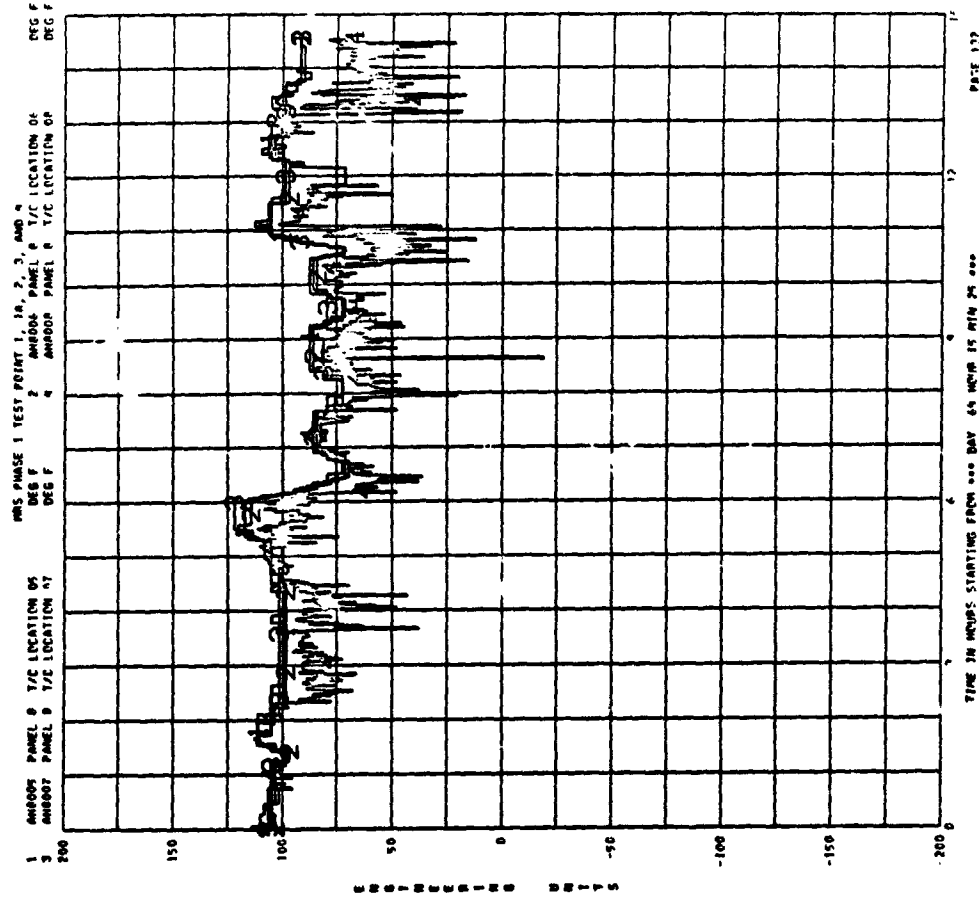
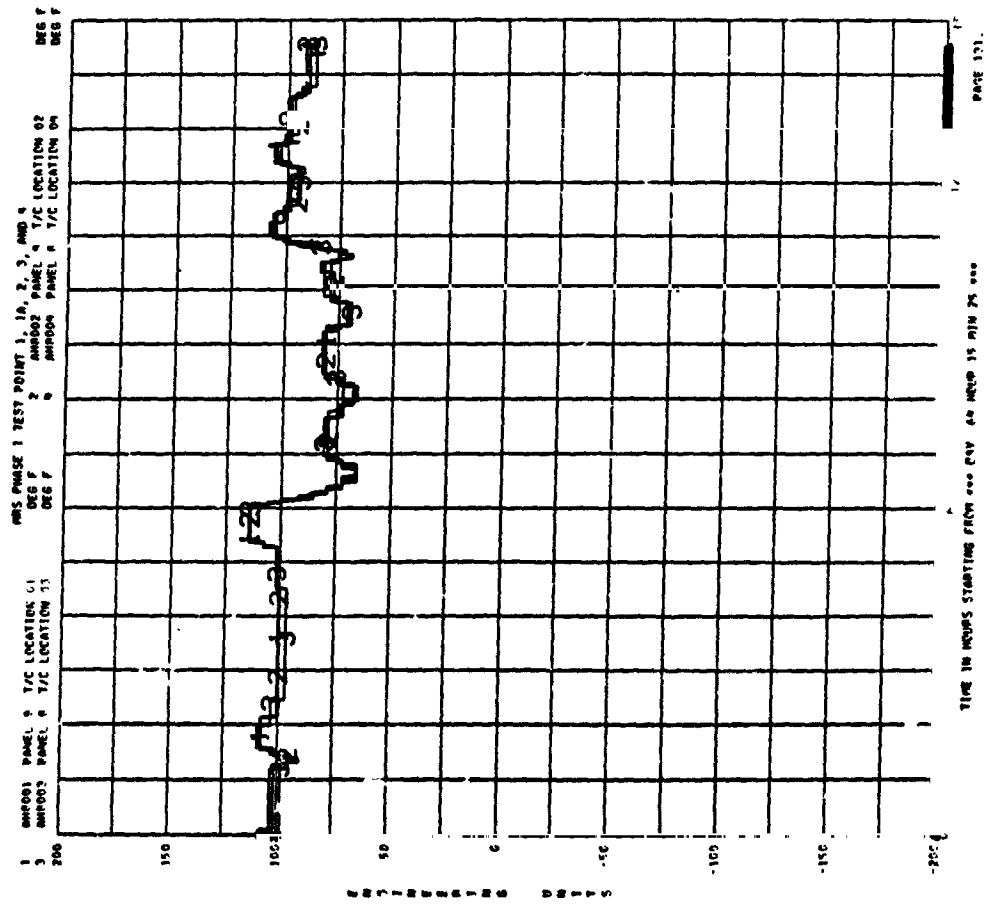
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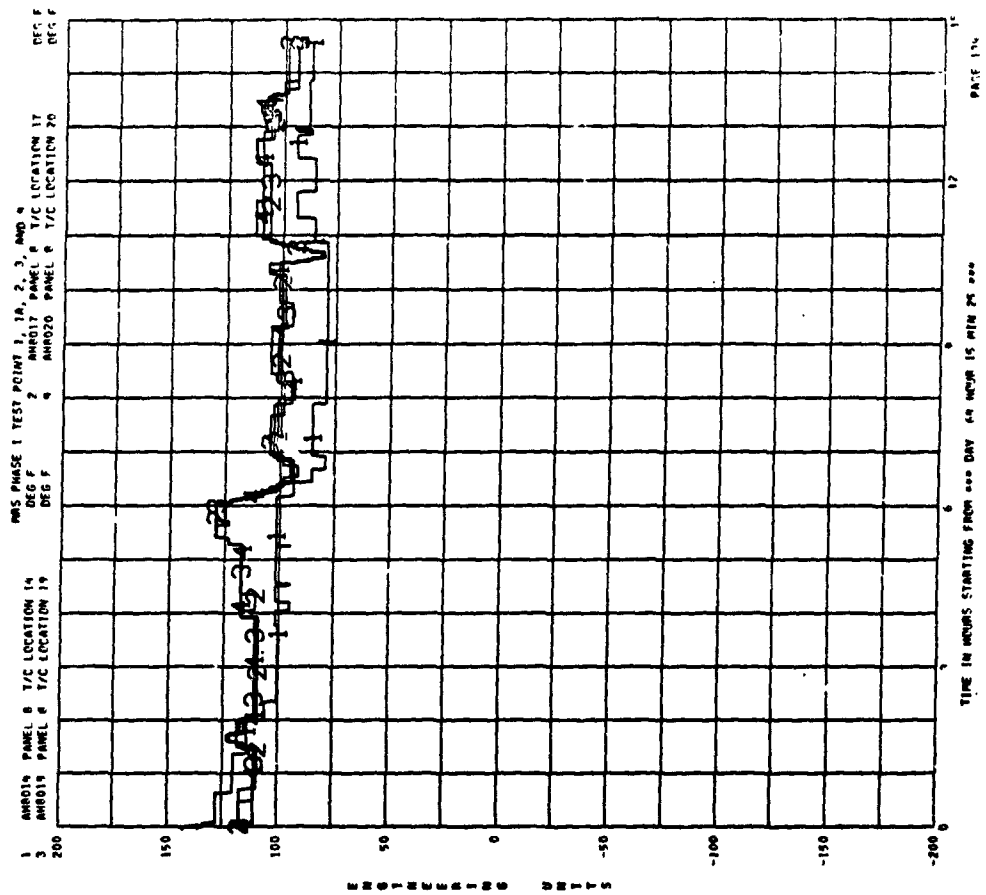
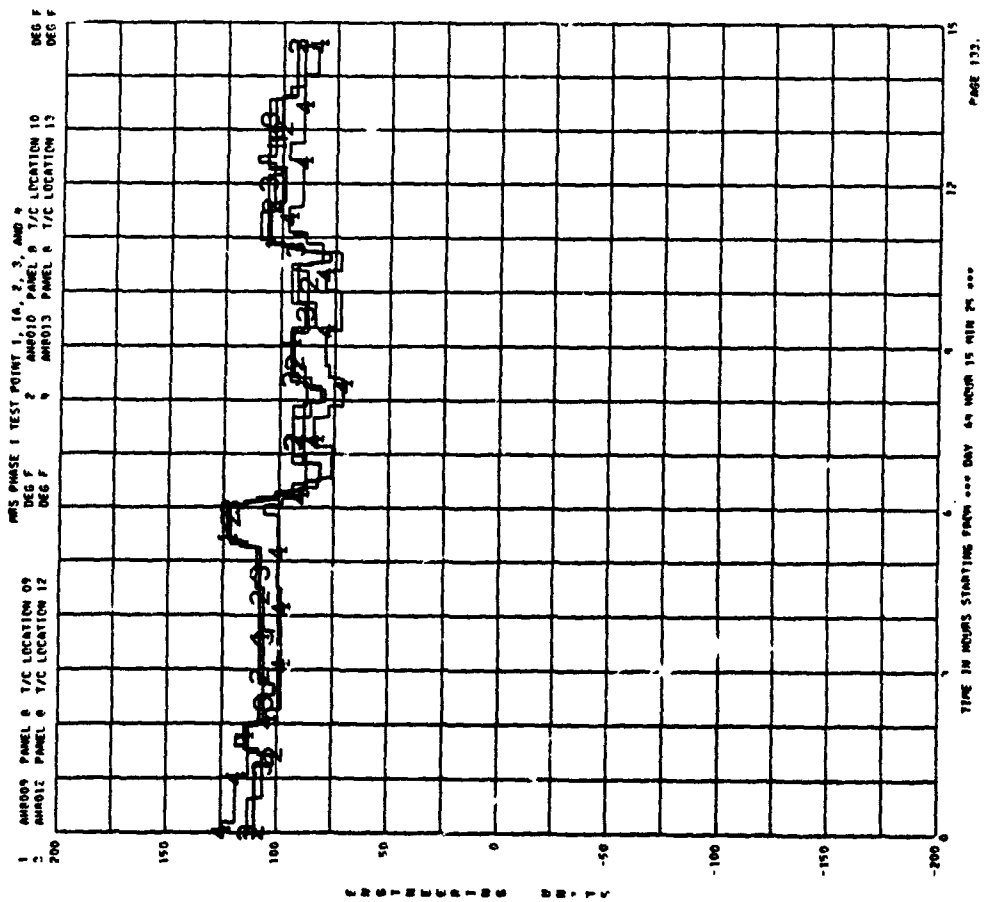
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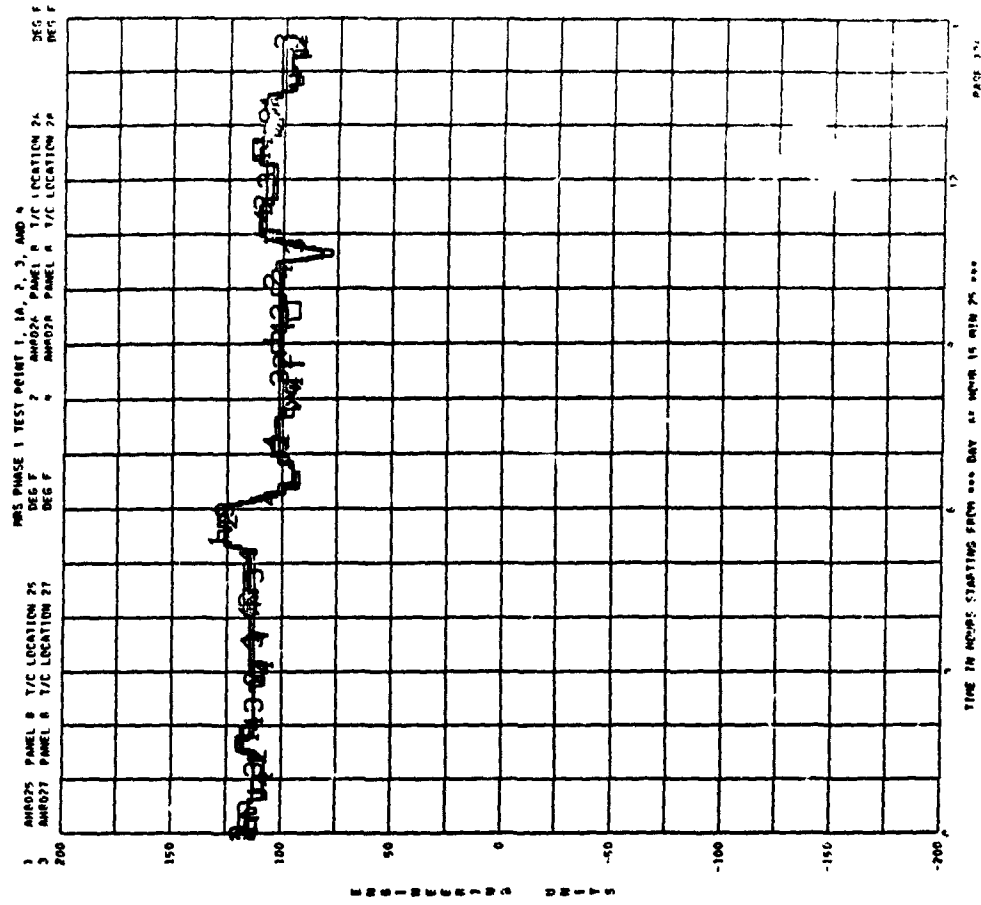
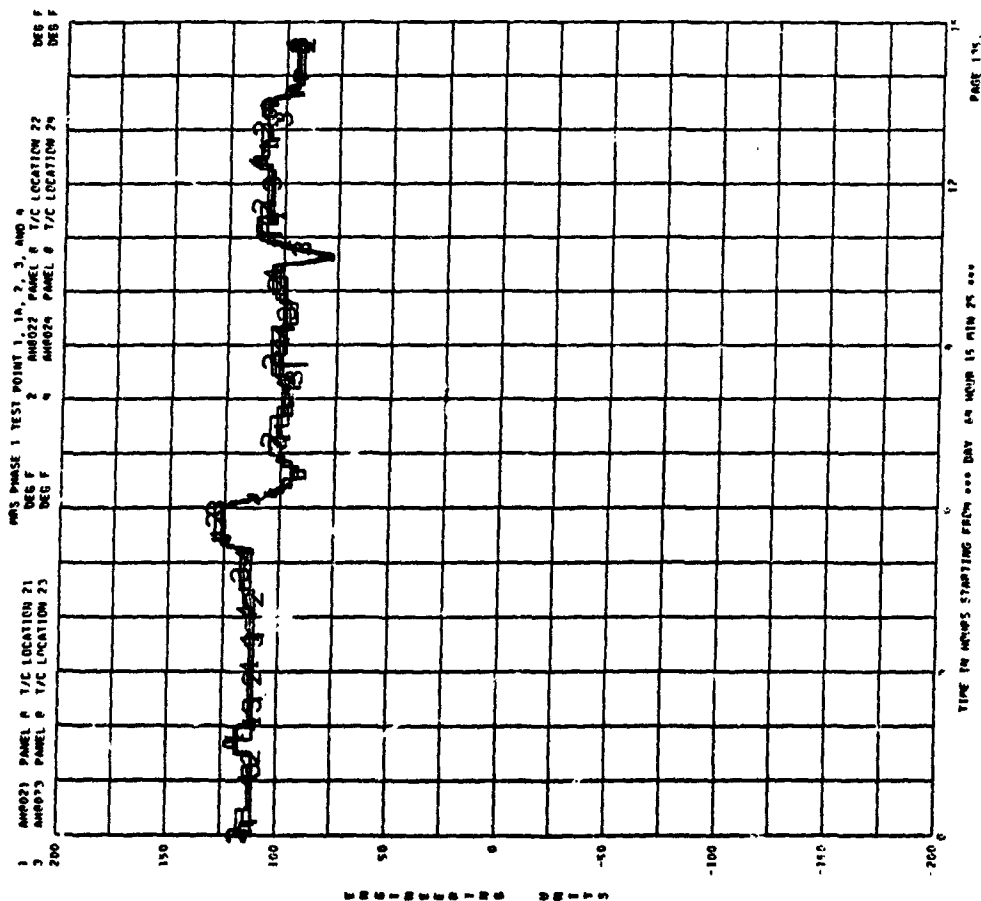


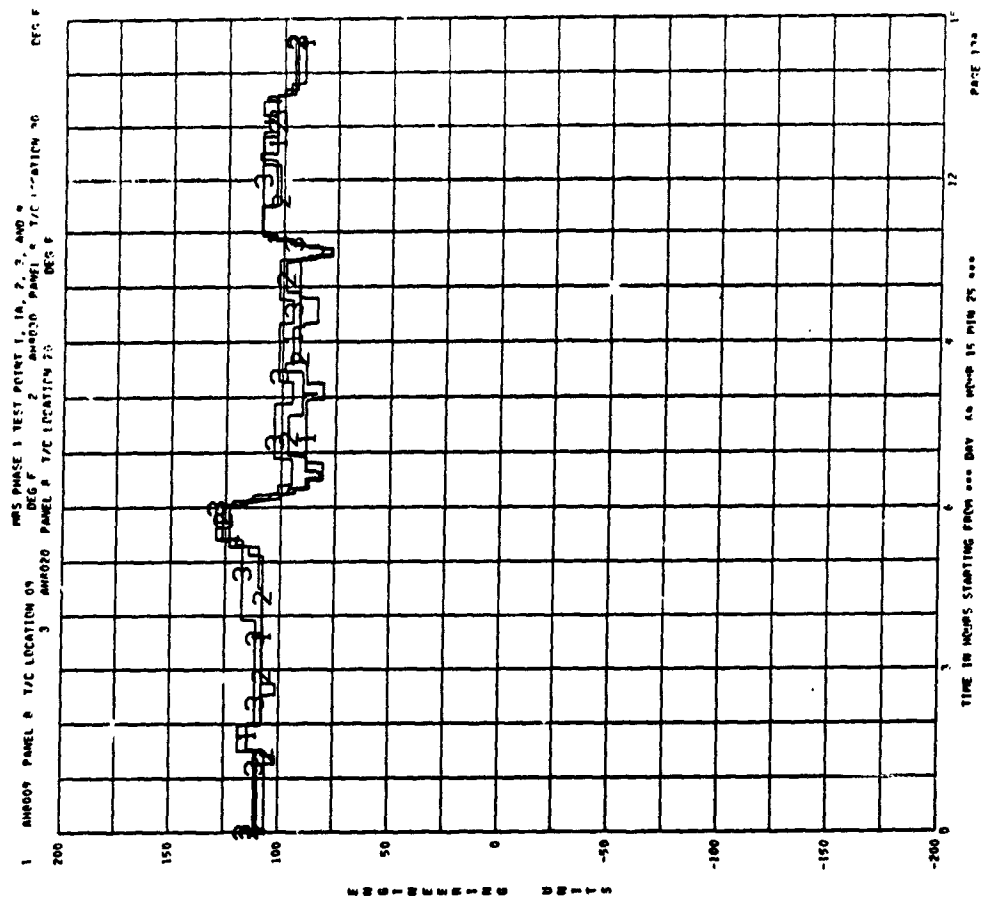
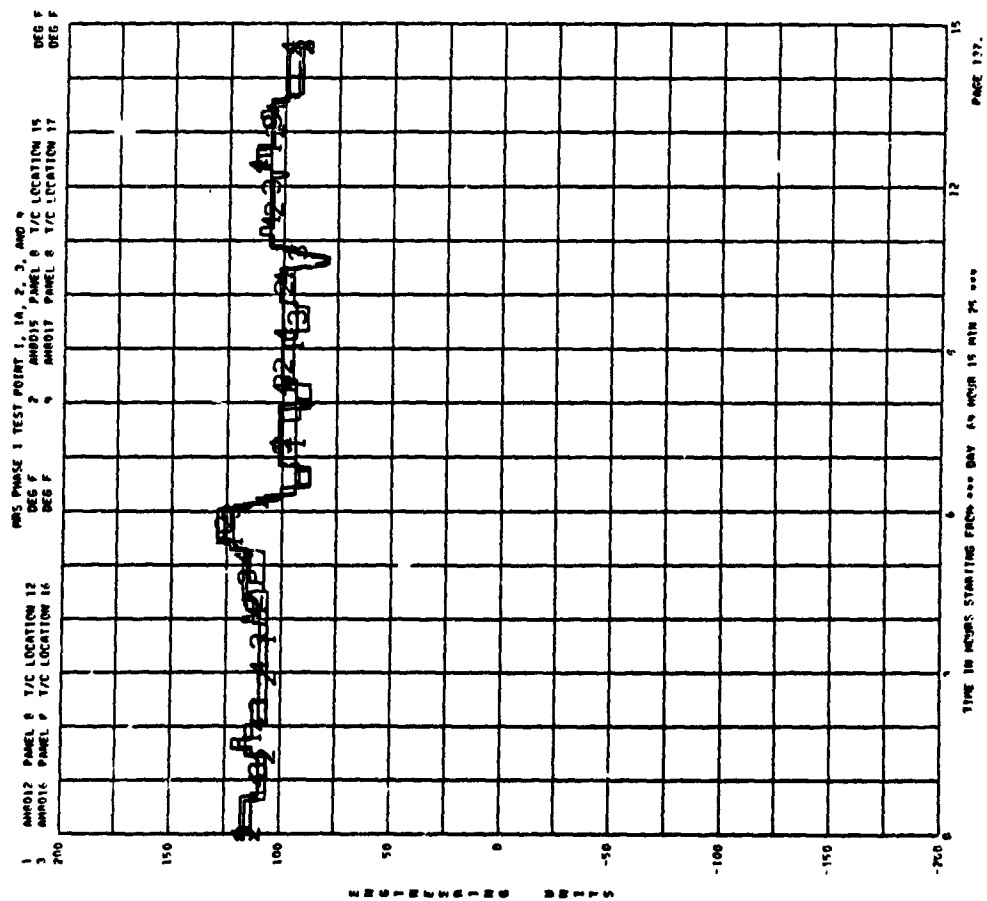
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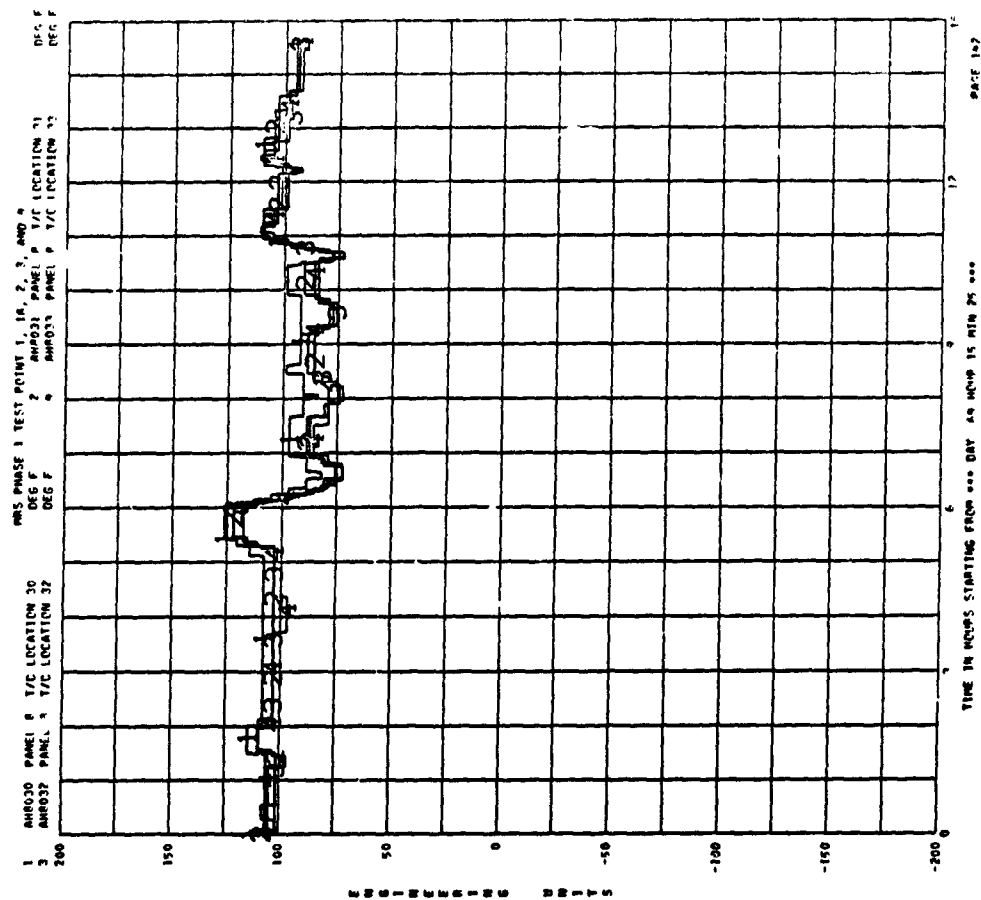
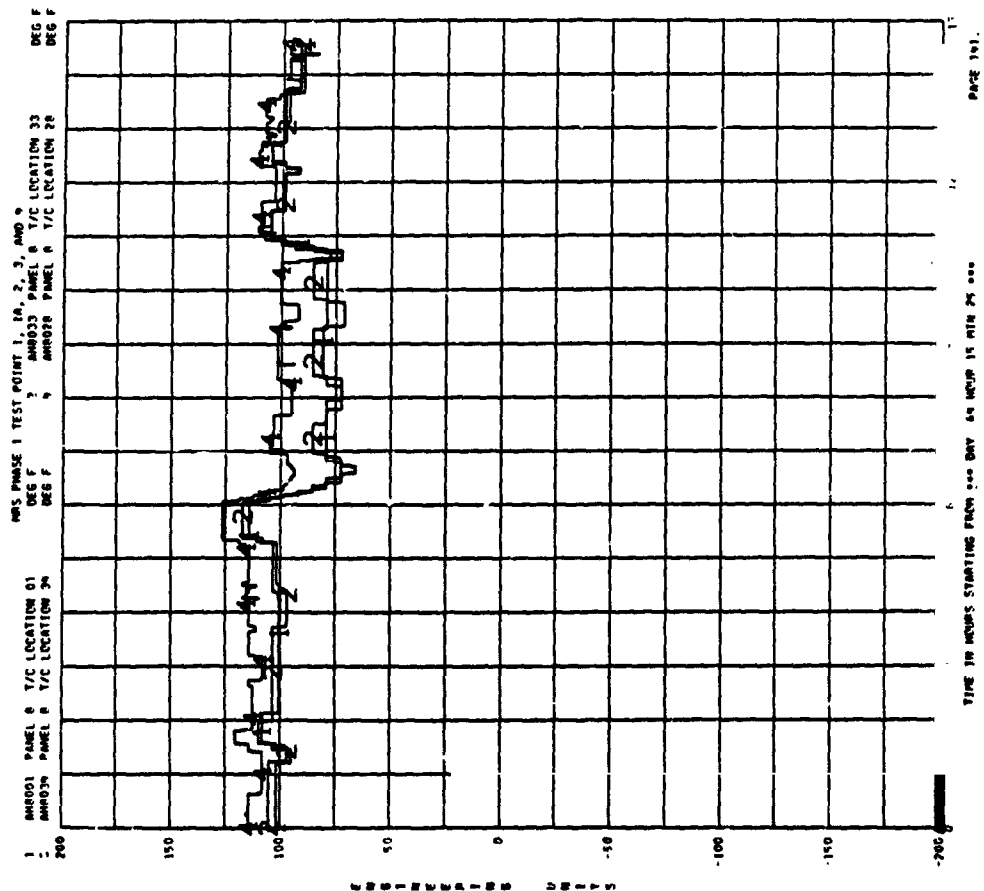
PAGE 120

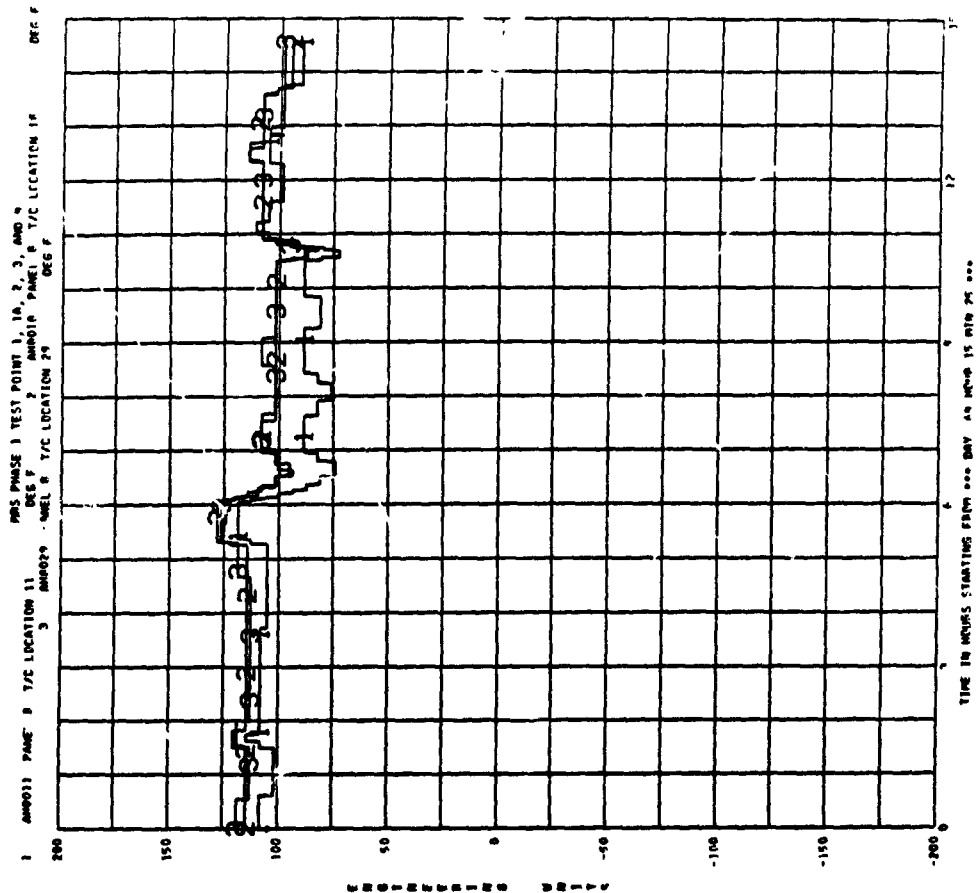
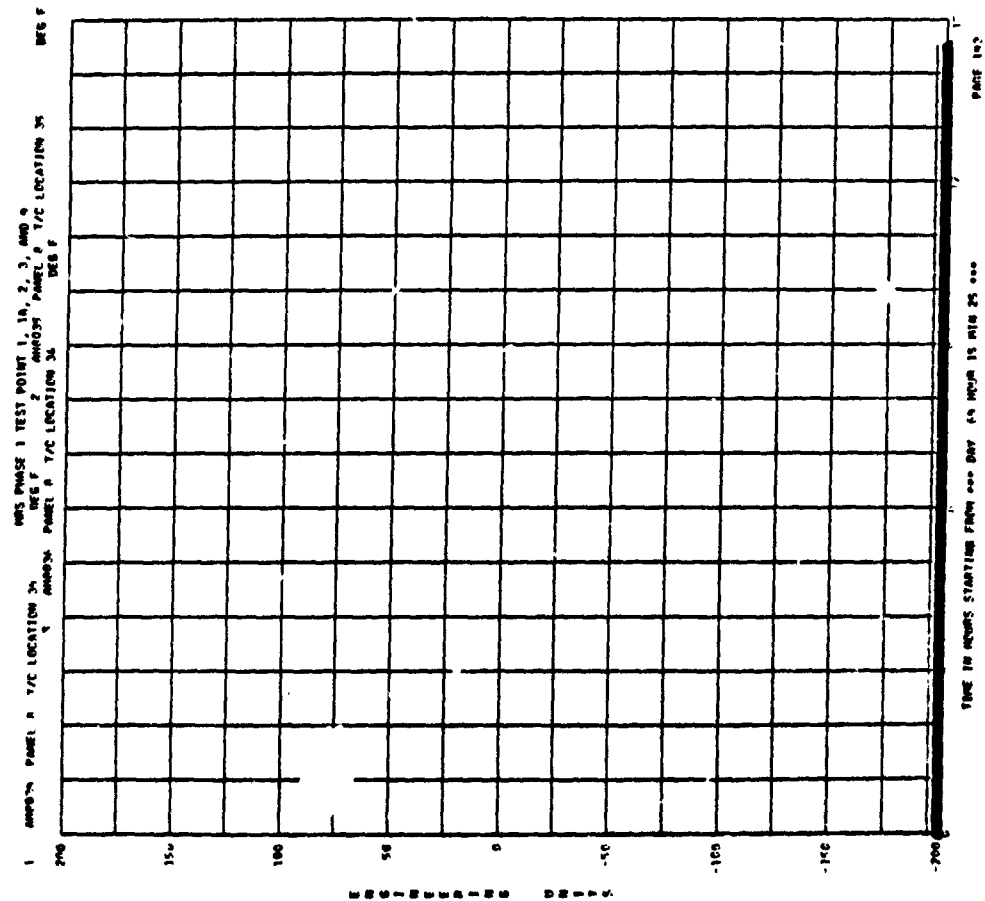










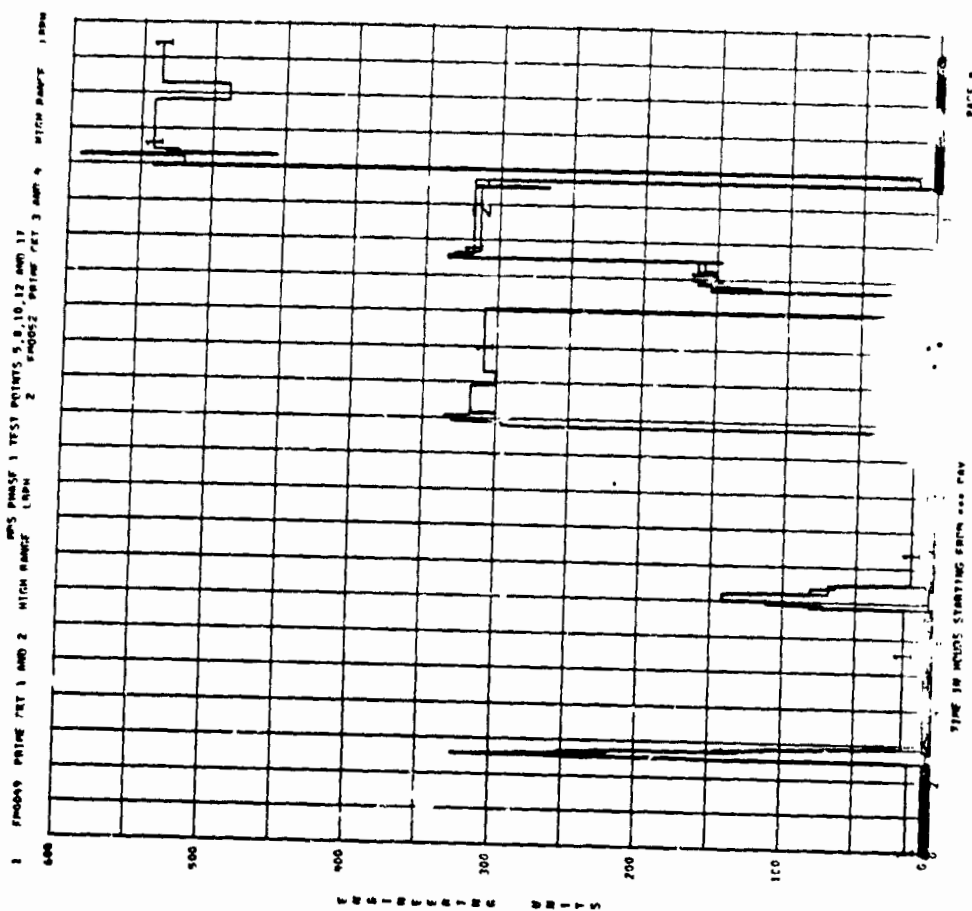
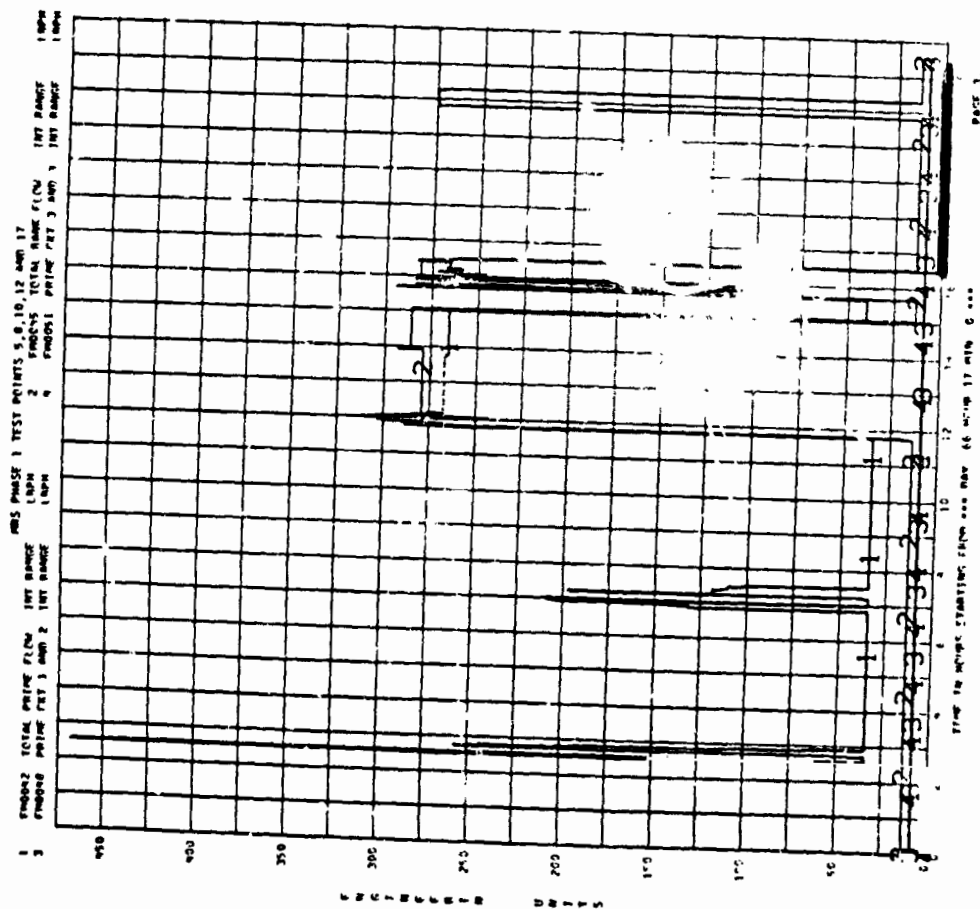


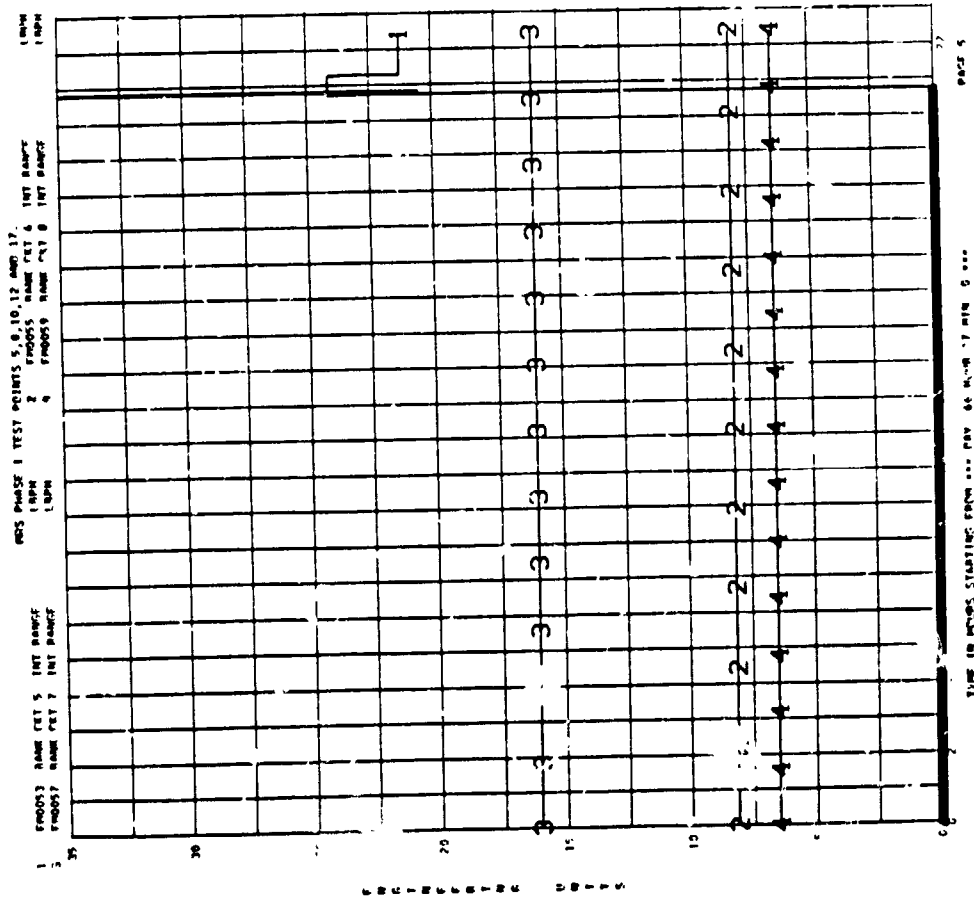
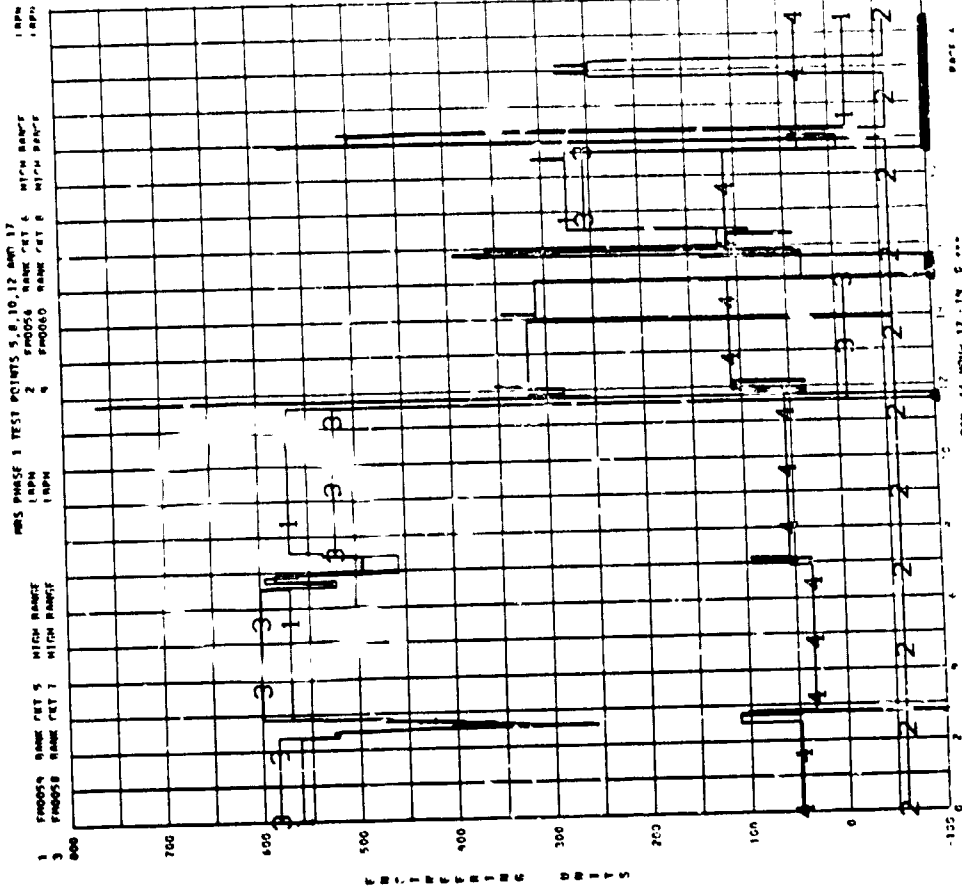
TEST GROUP B

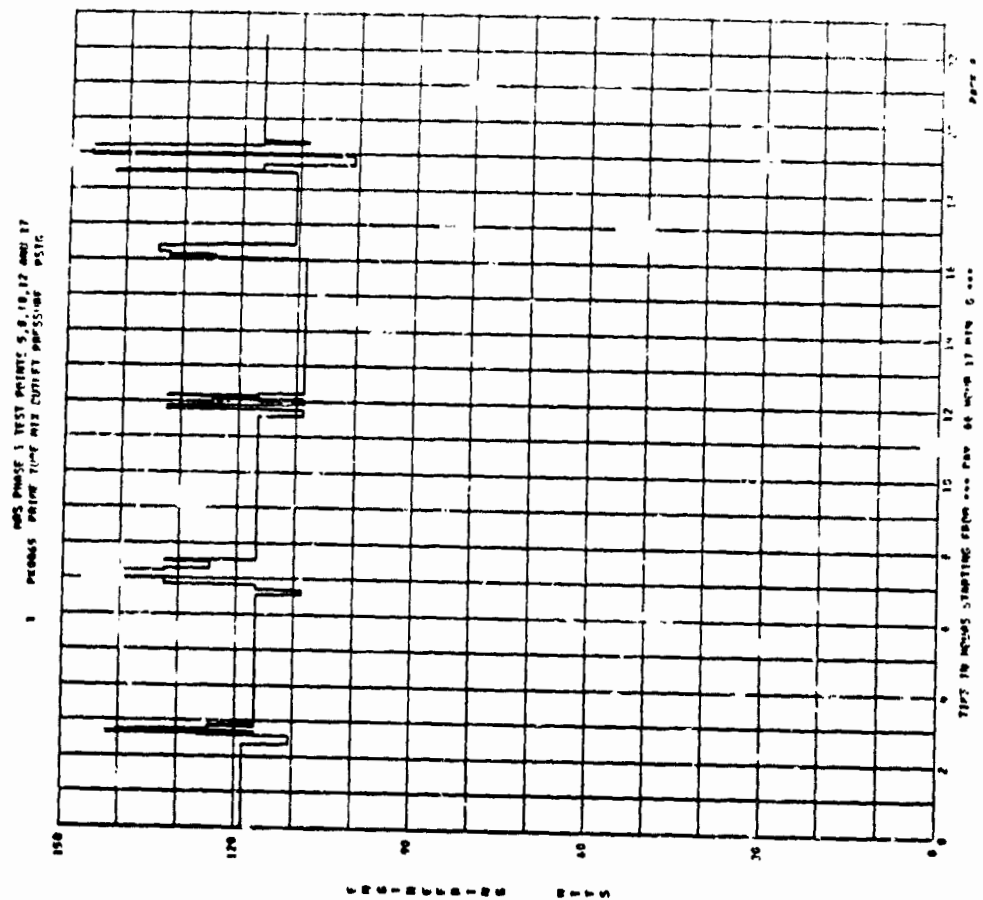
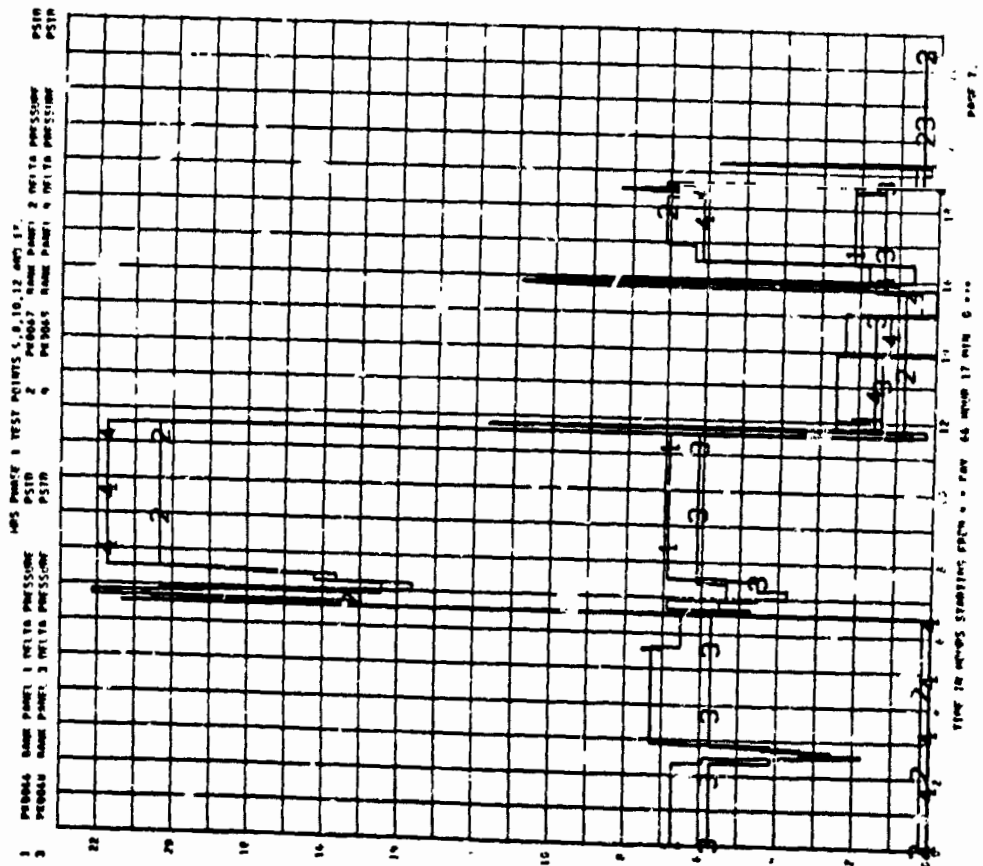
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INCLUDES TEST POINTS

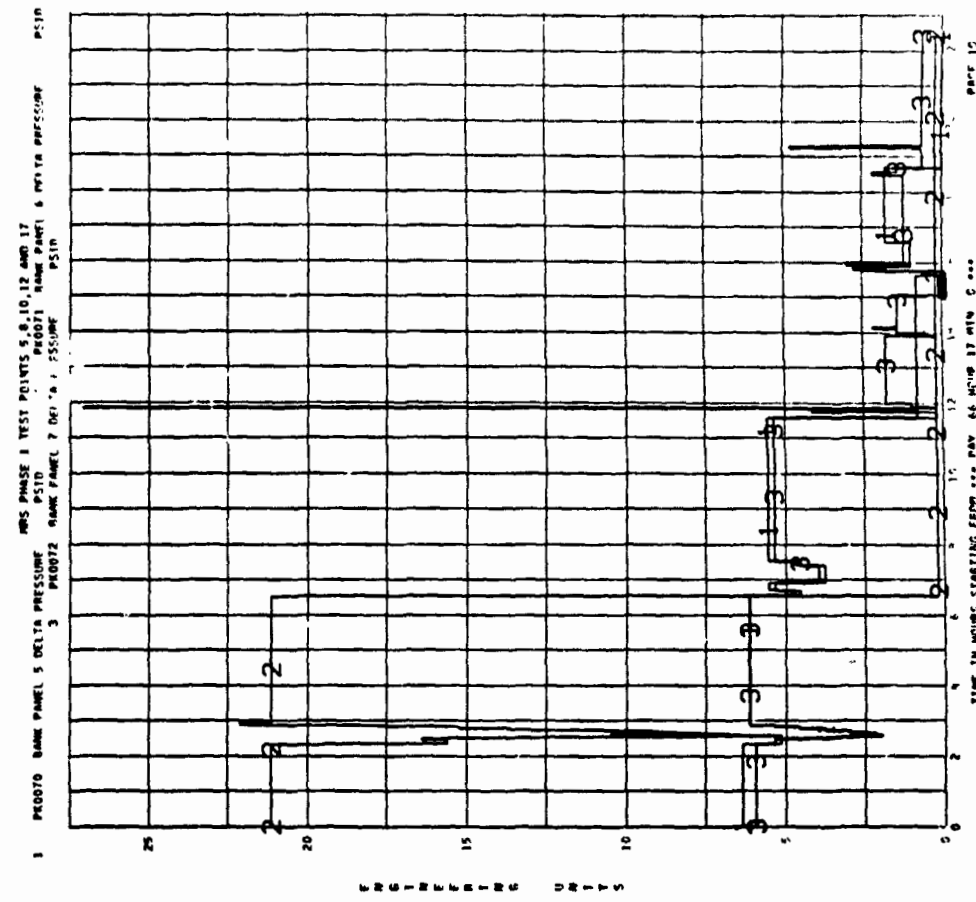
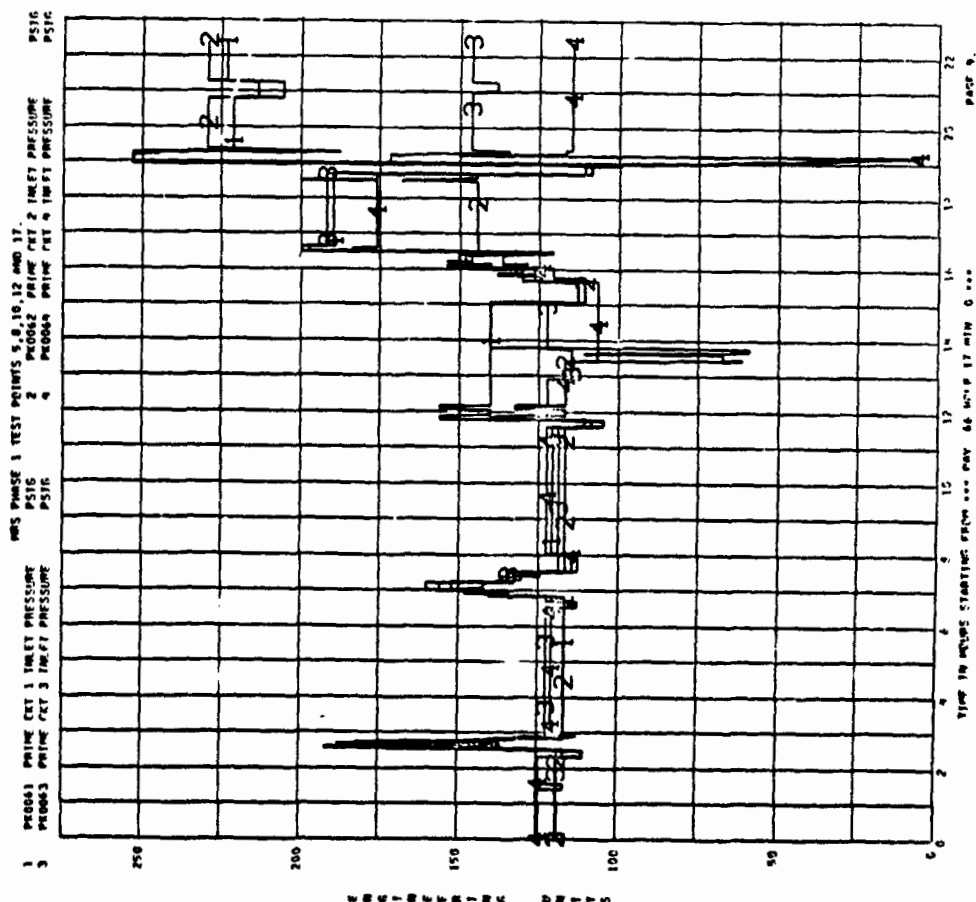
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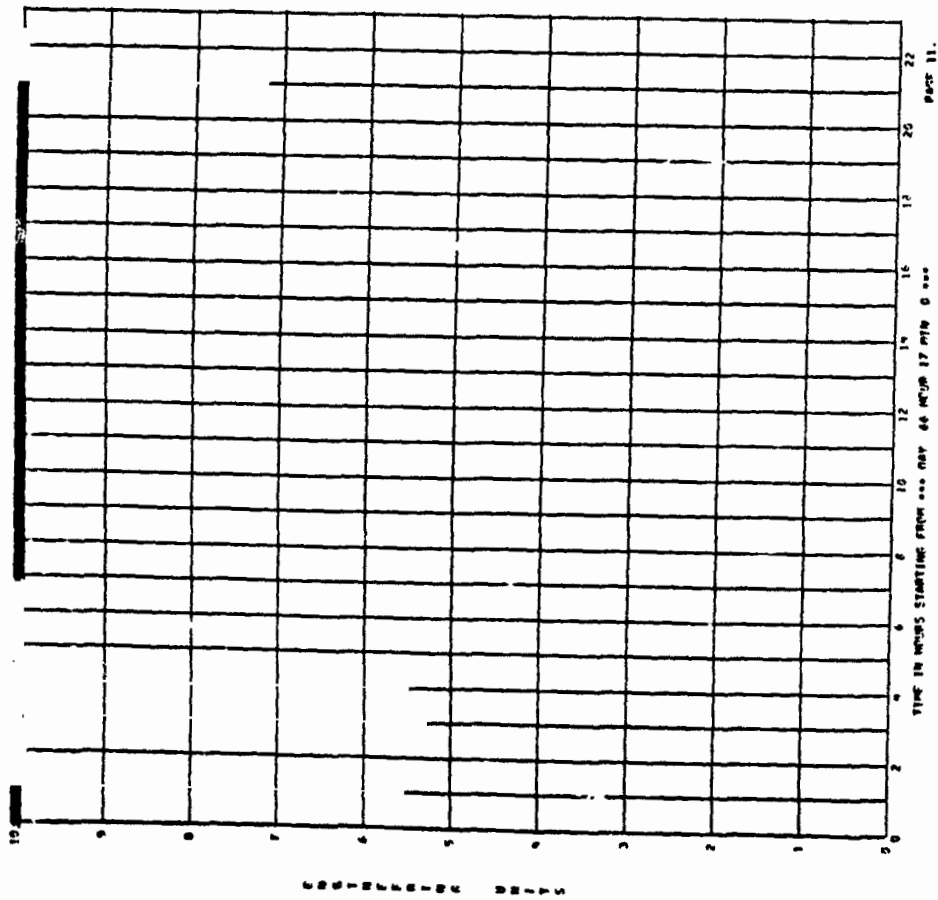




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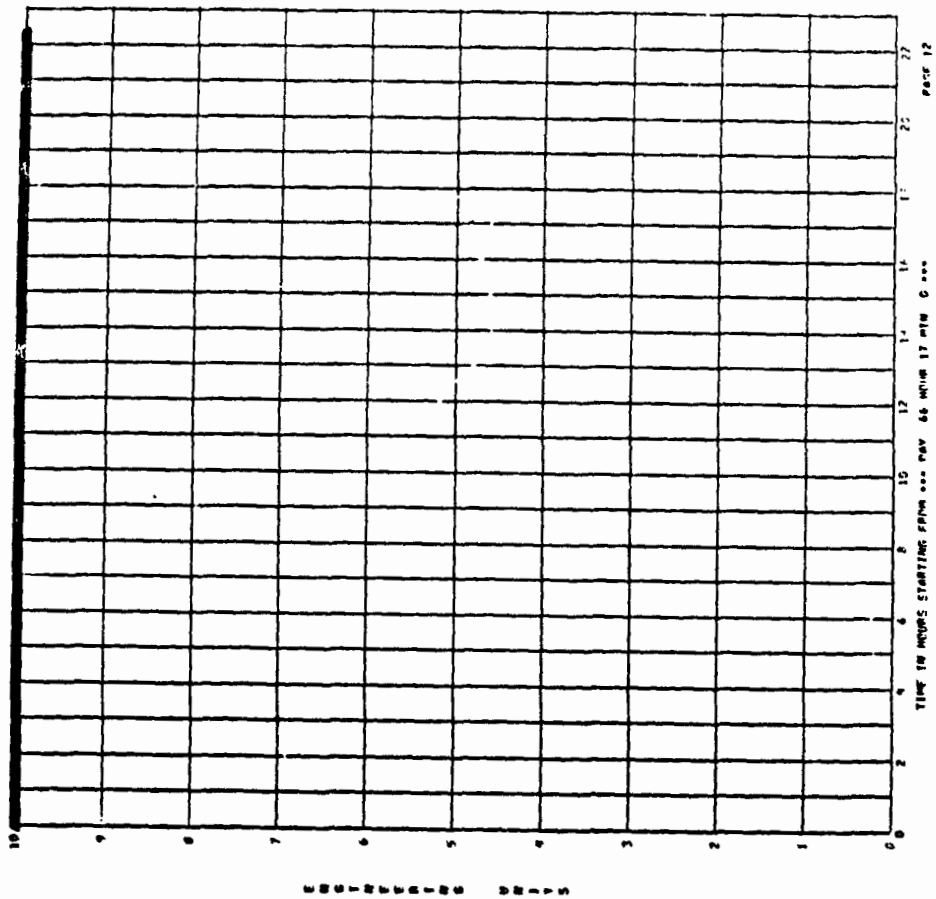


PHASE 1 TEST POINTS 5, 8, 10, 12 AND 17.
 1 410001 PRIME SYSTEM INLET



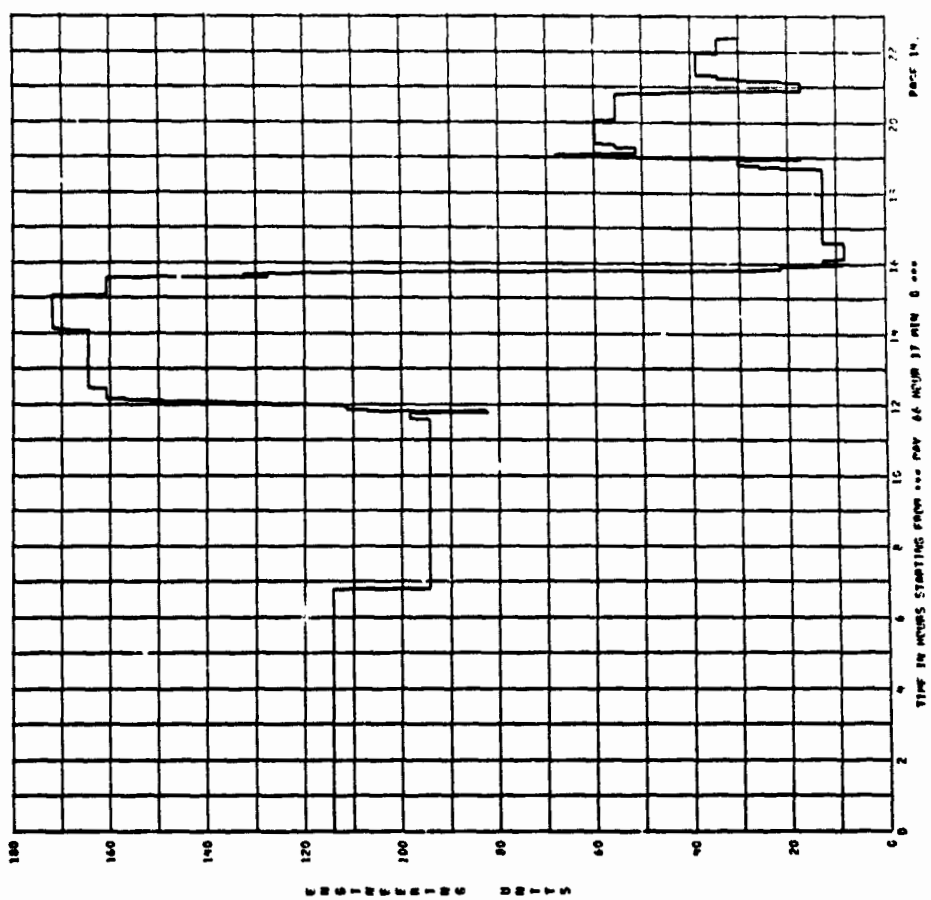
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PHASE 1 TEST POINTS 5, 8, 10, 12 AND 17.
 1 410002 BANK SYSTEM INLET

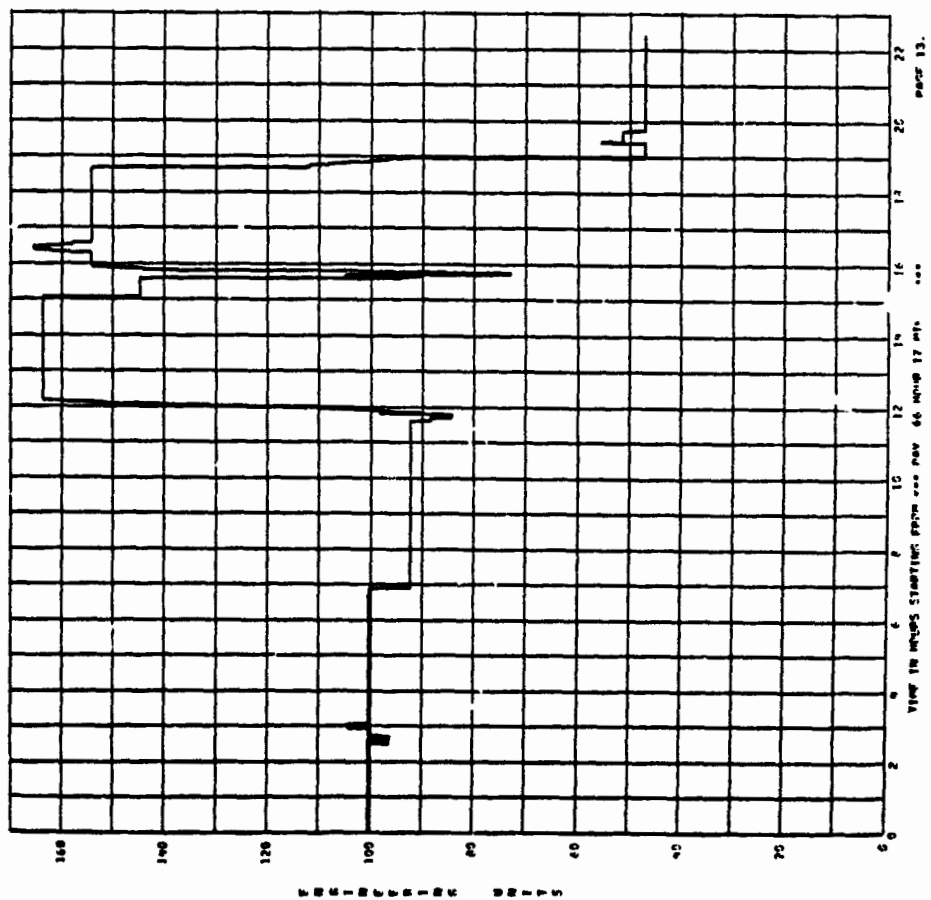


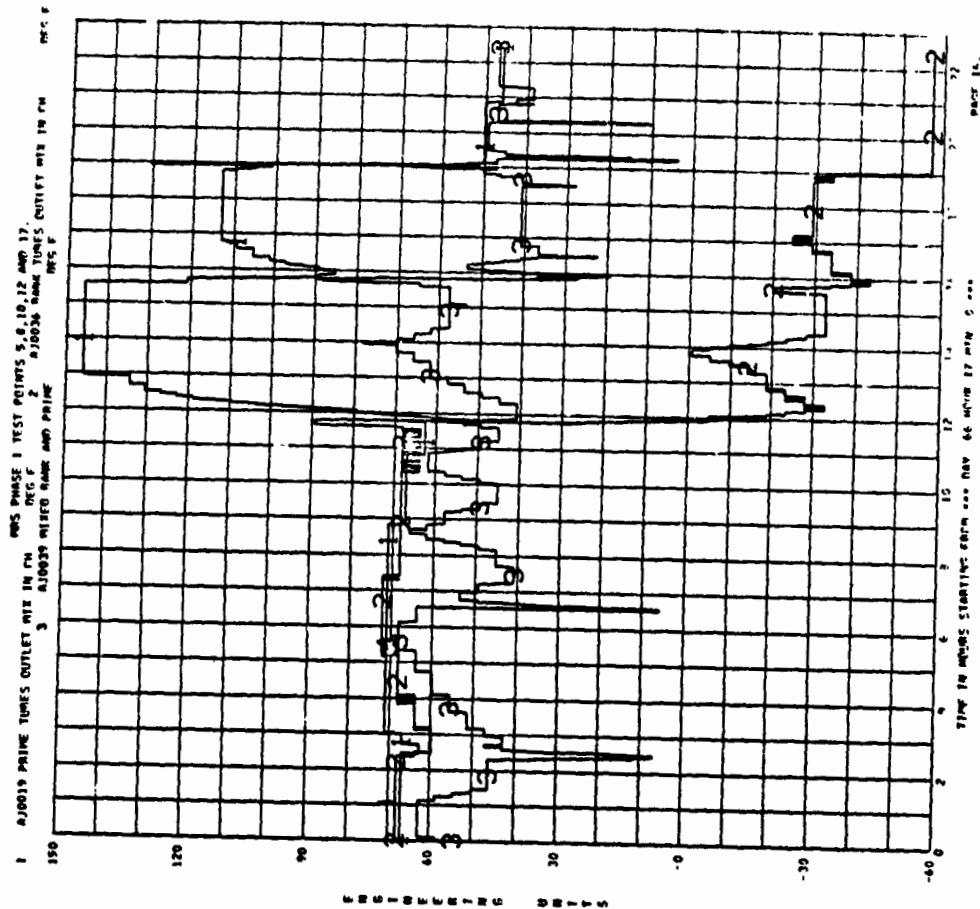
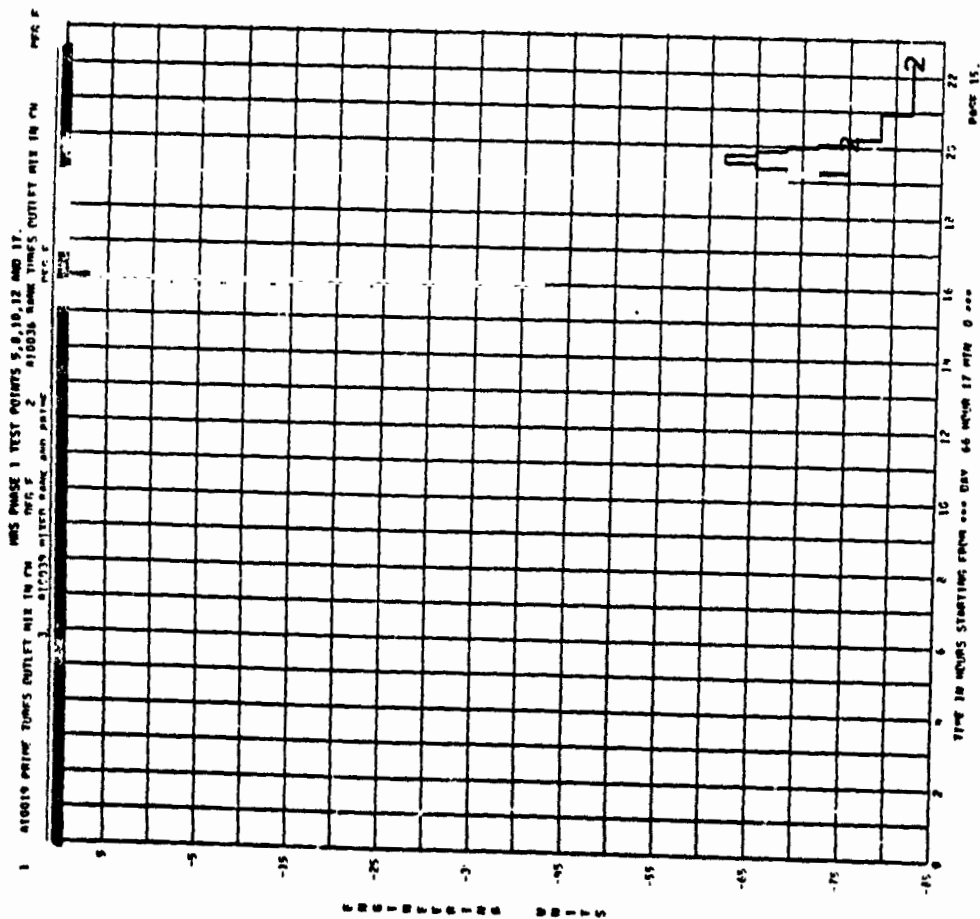
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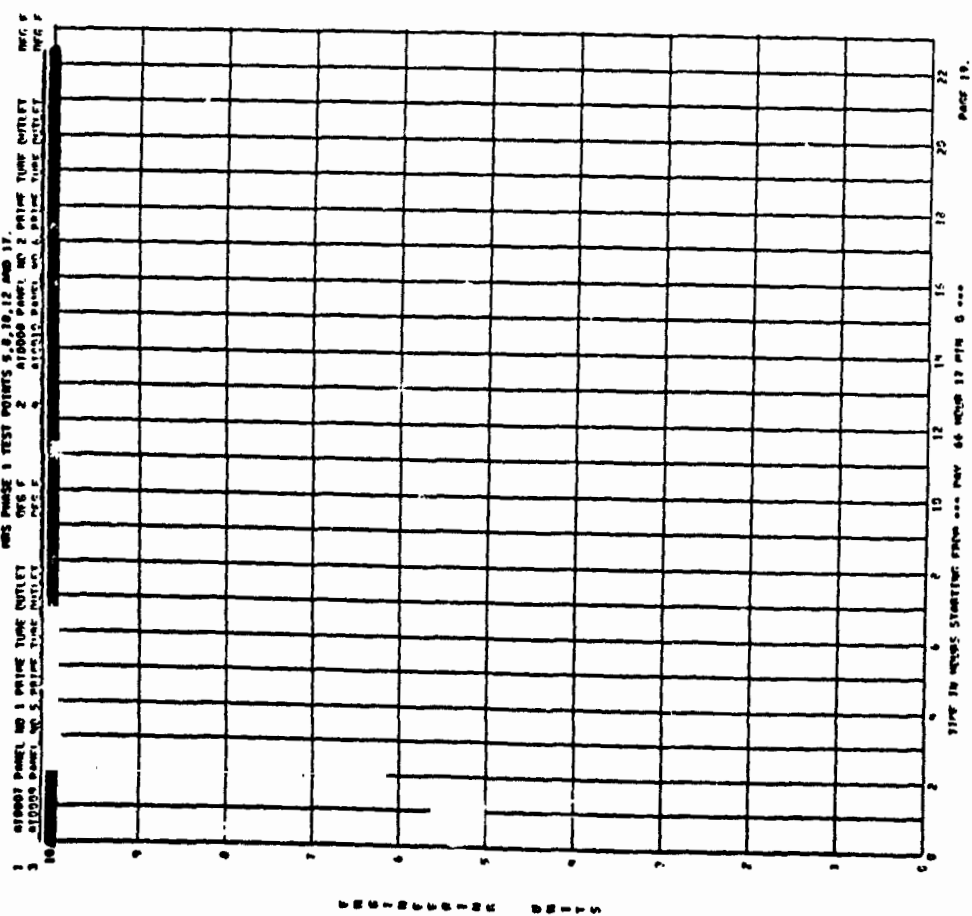
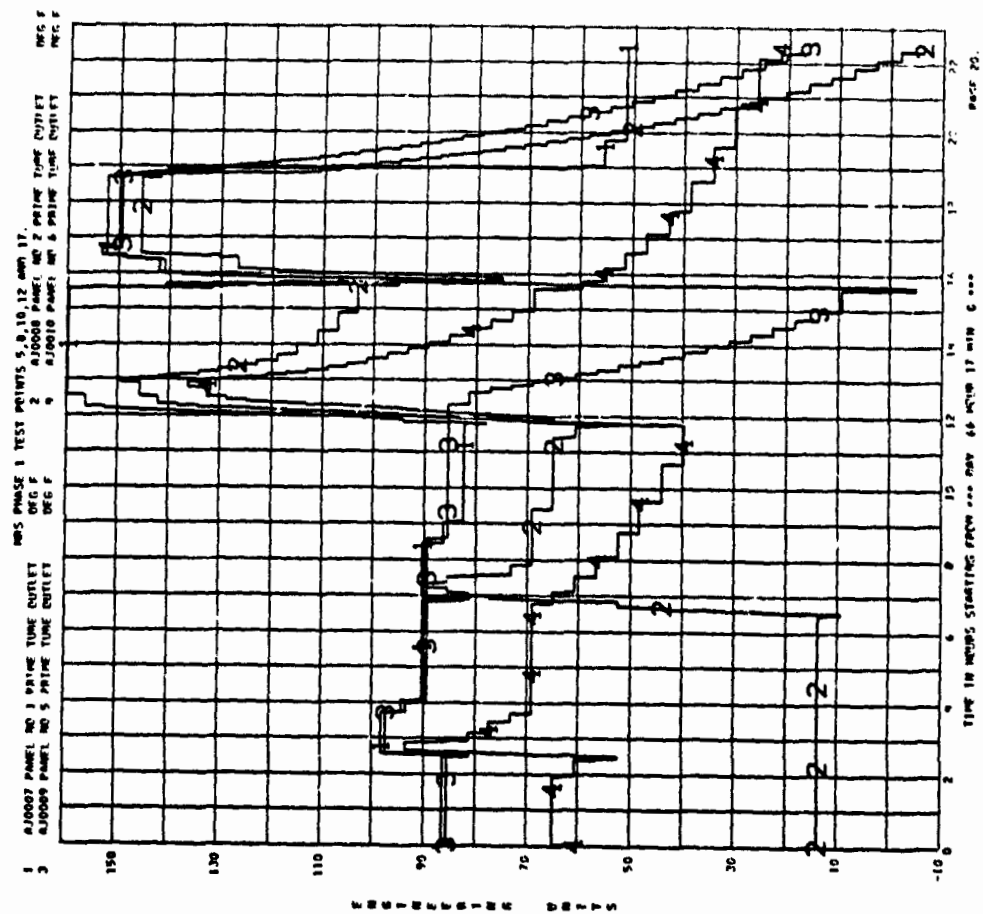
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 DEC 7

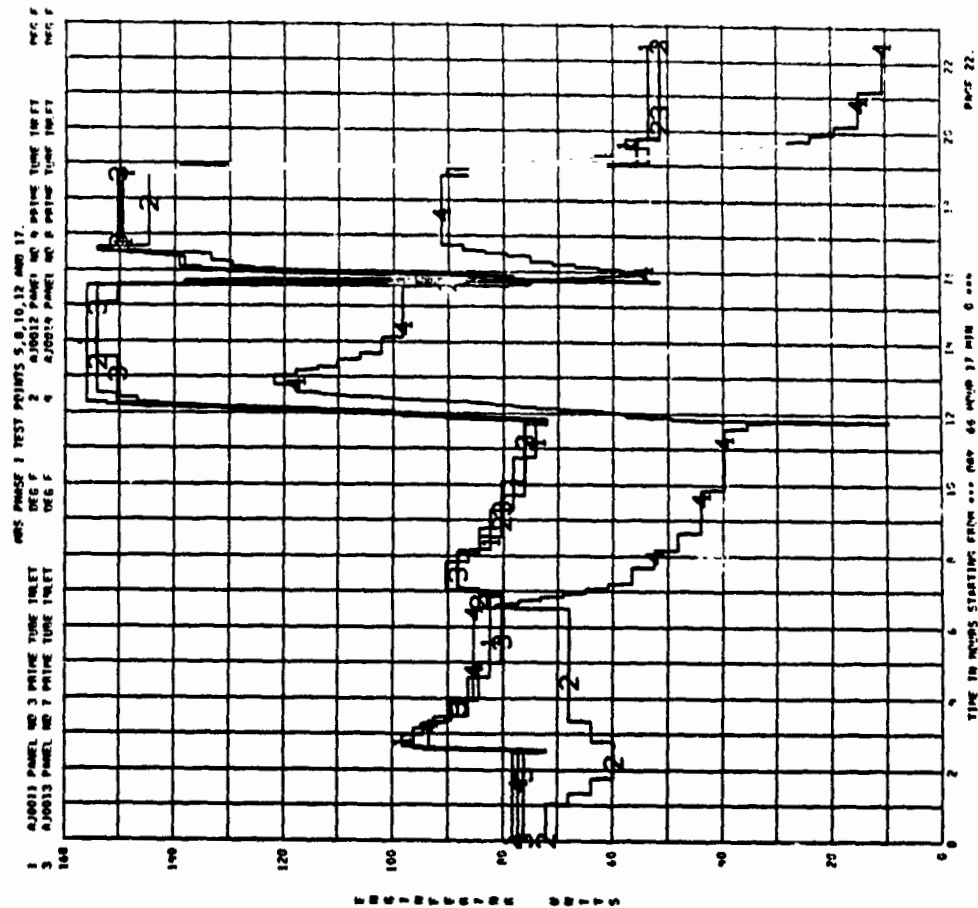
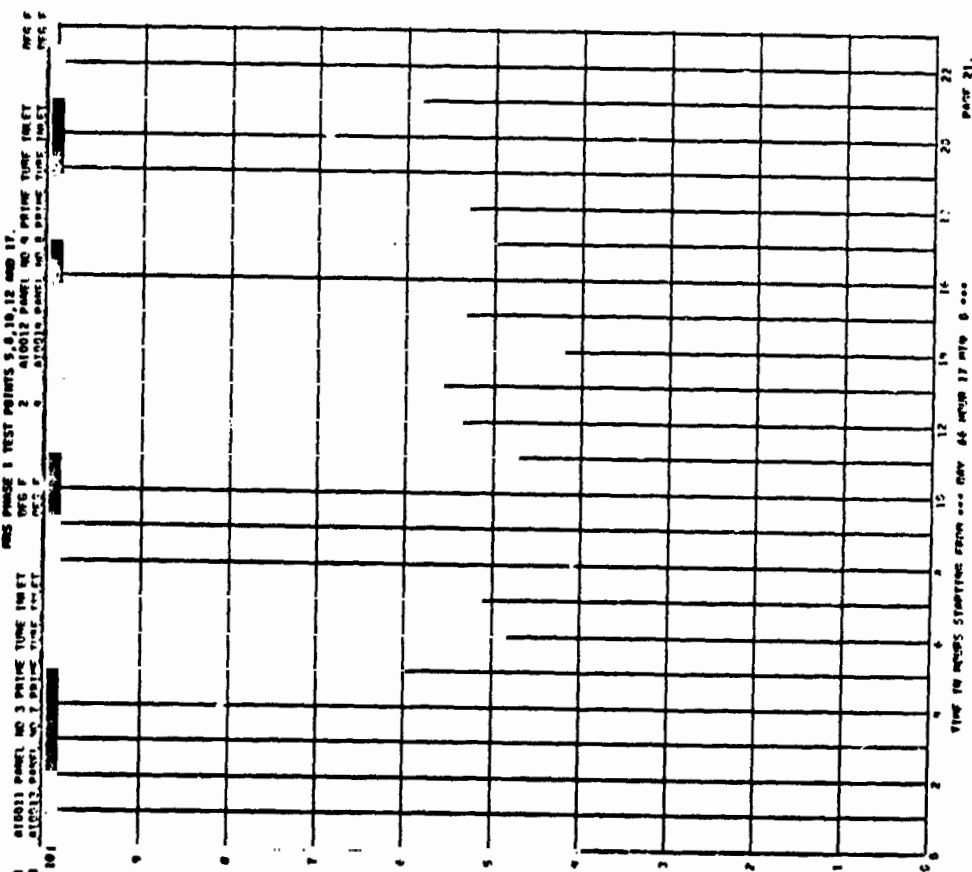


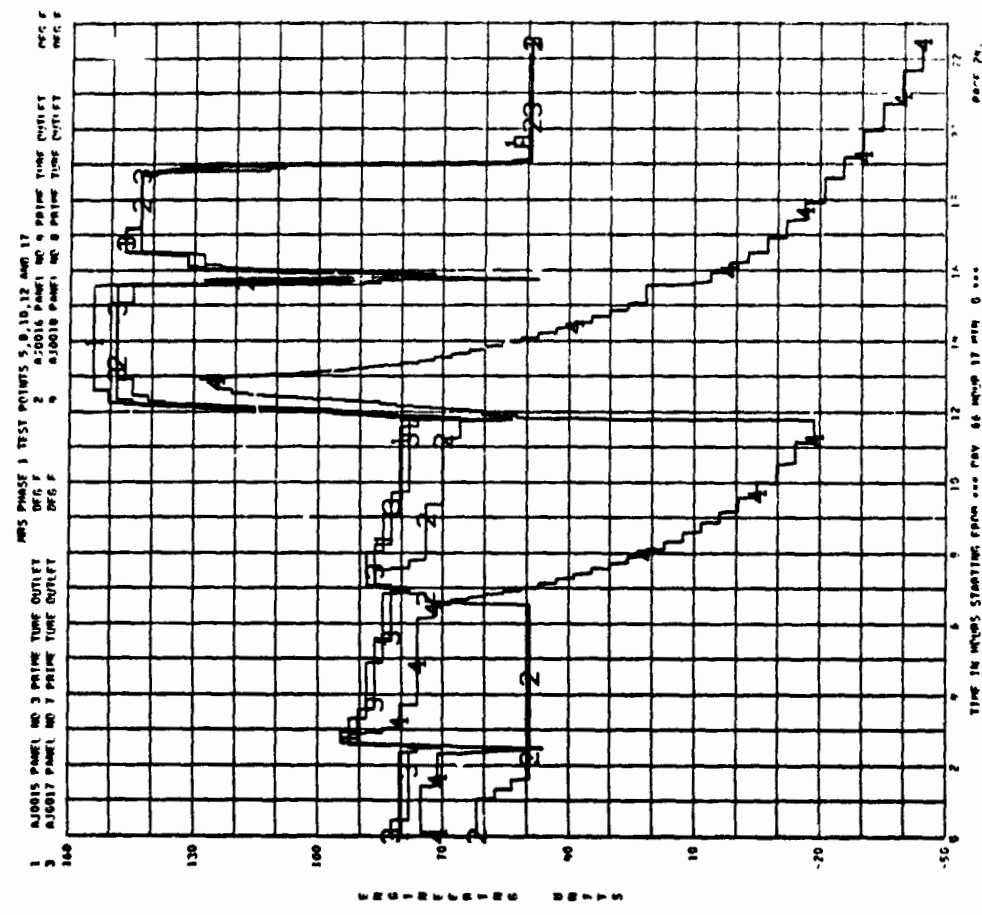
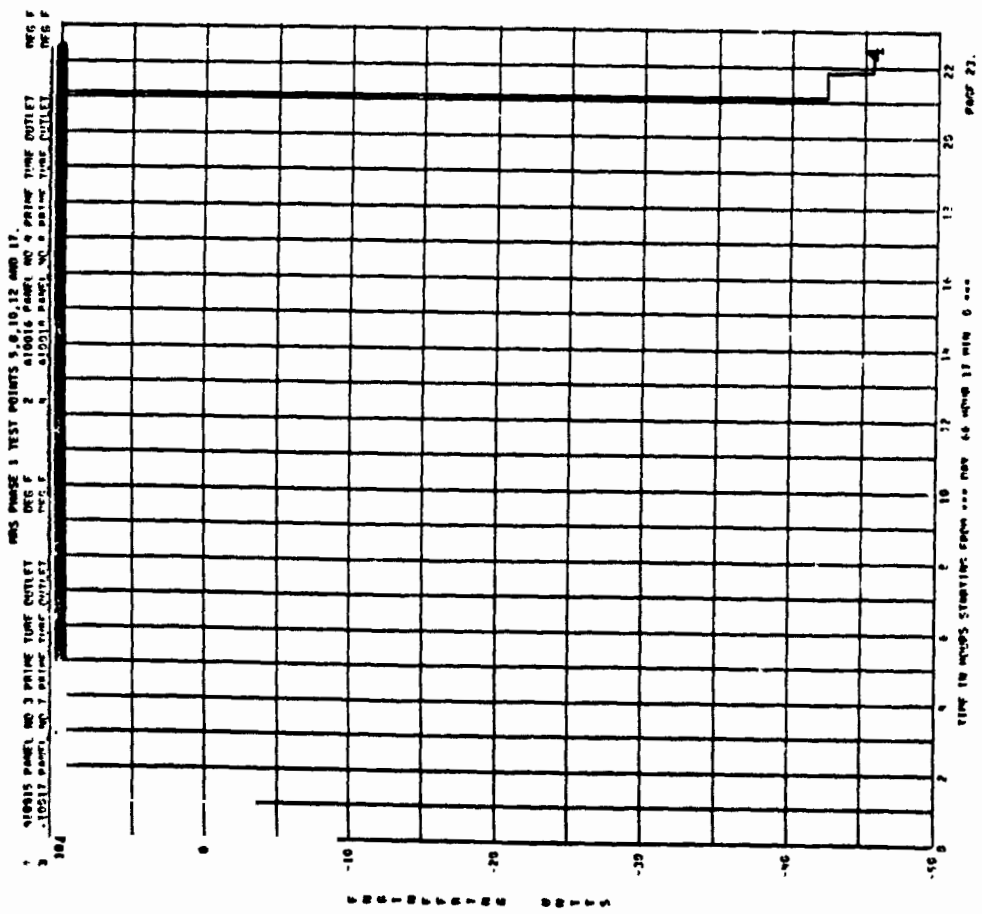
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 DEC 7

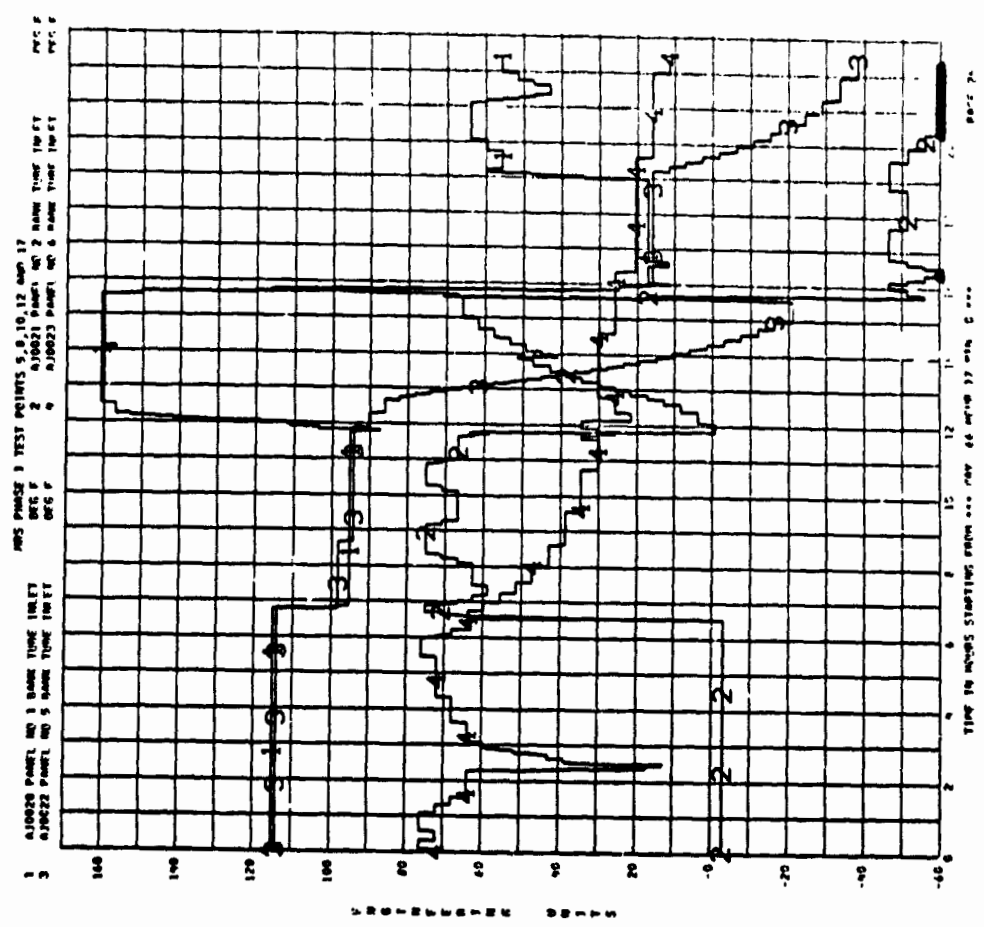
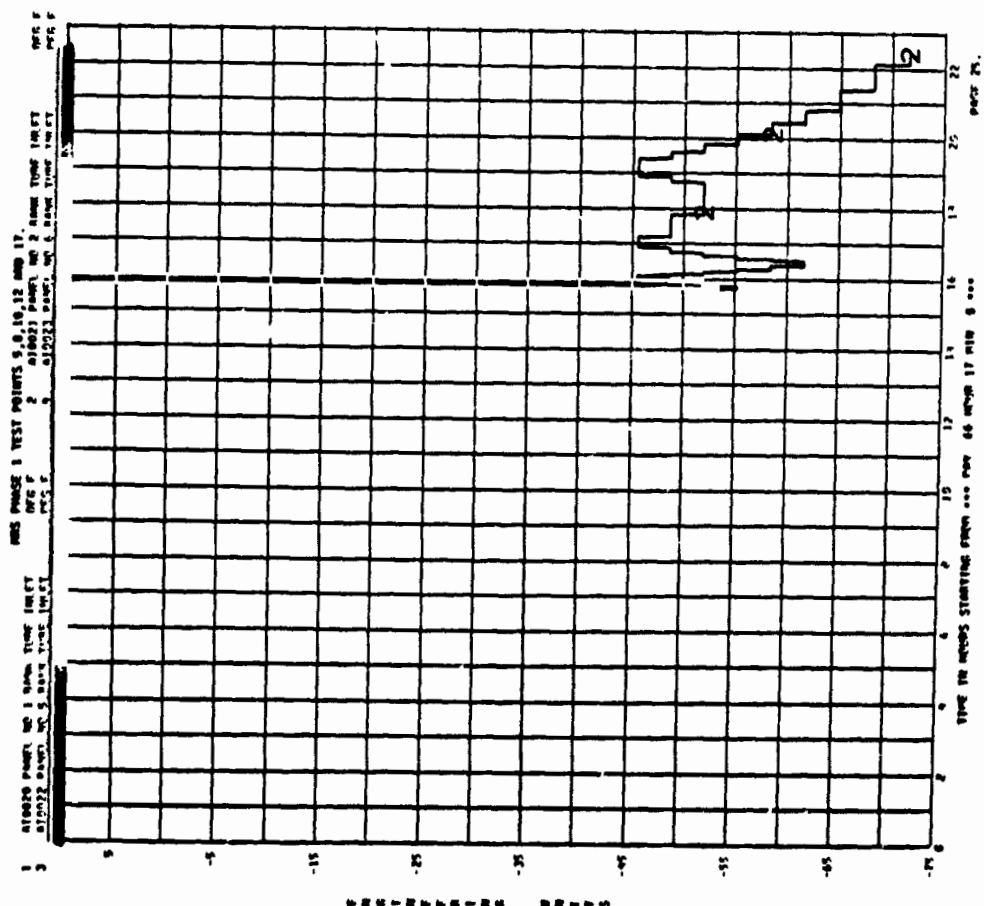


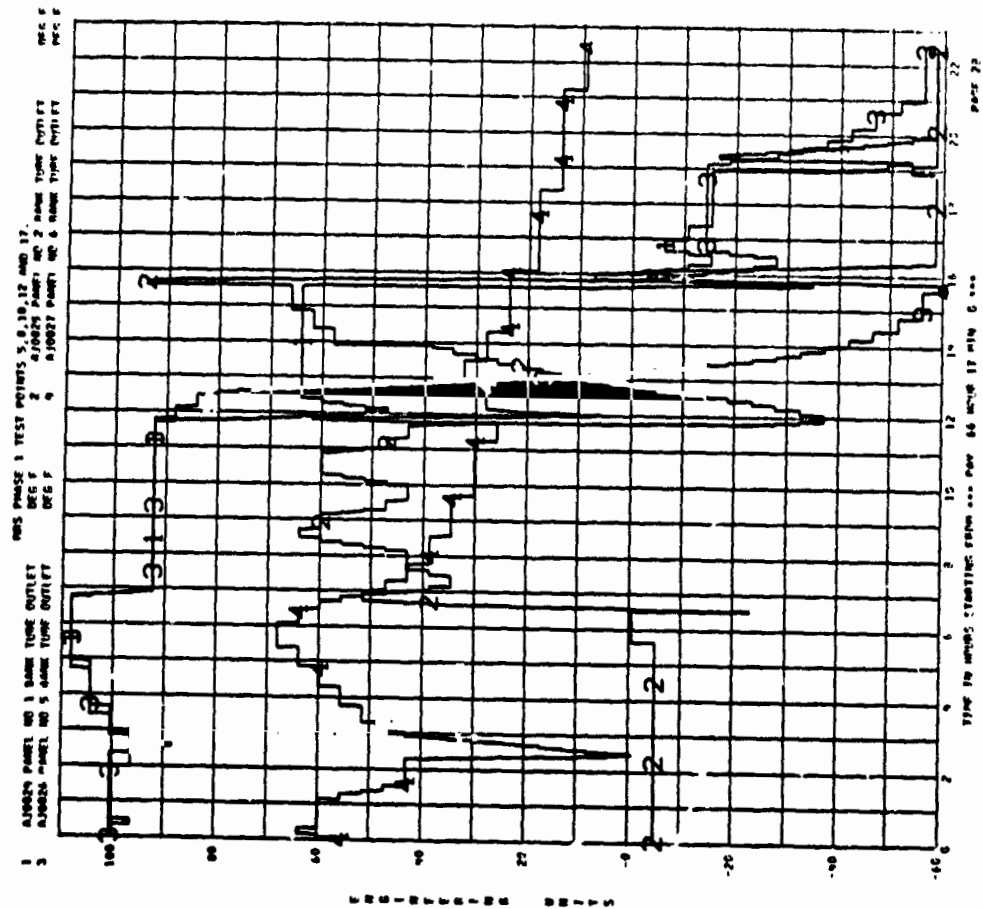
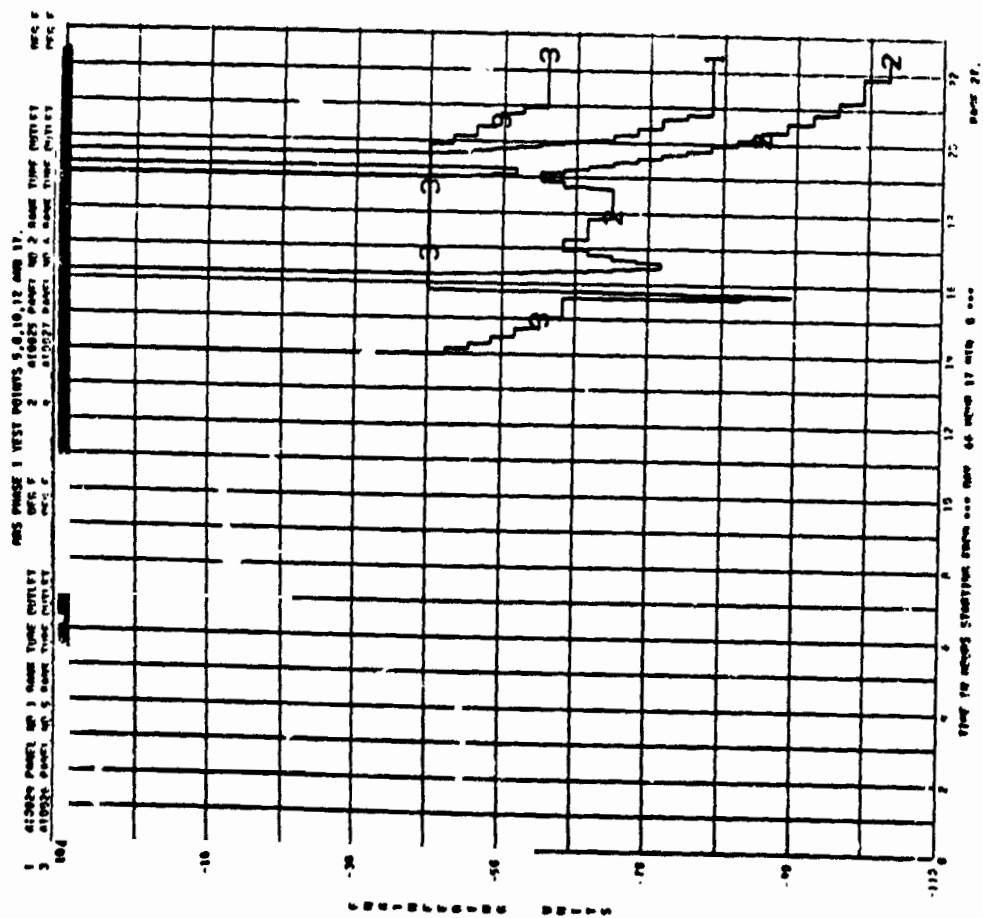


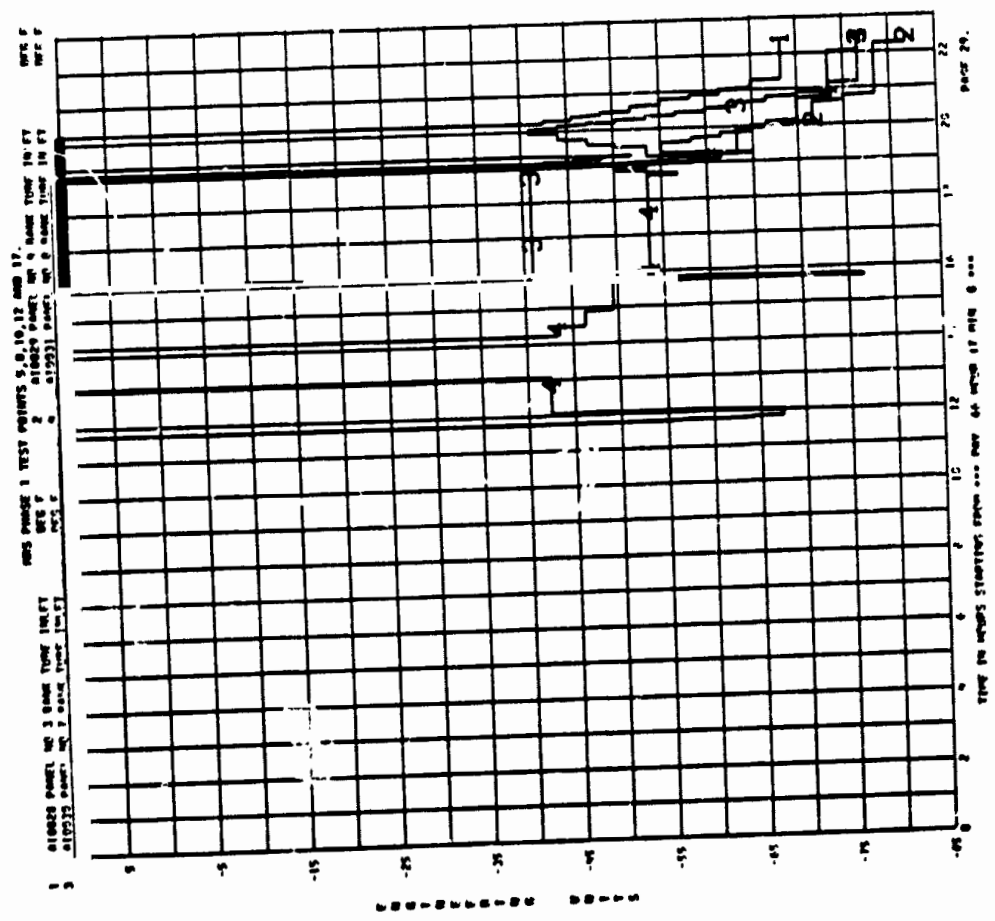
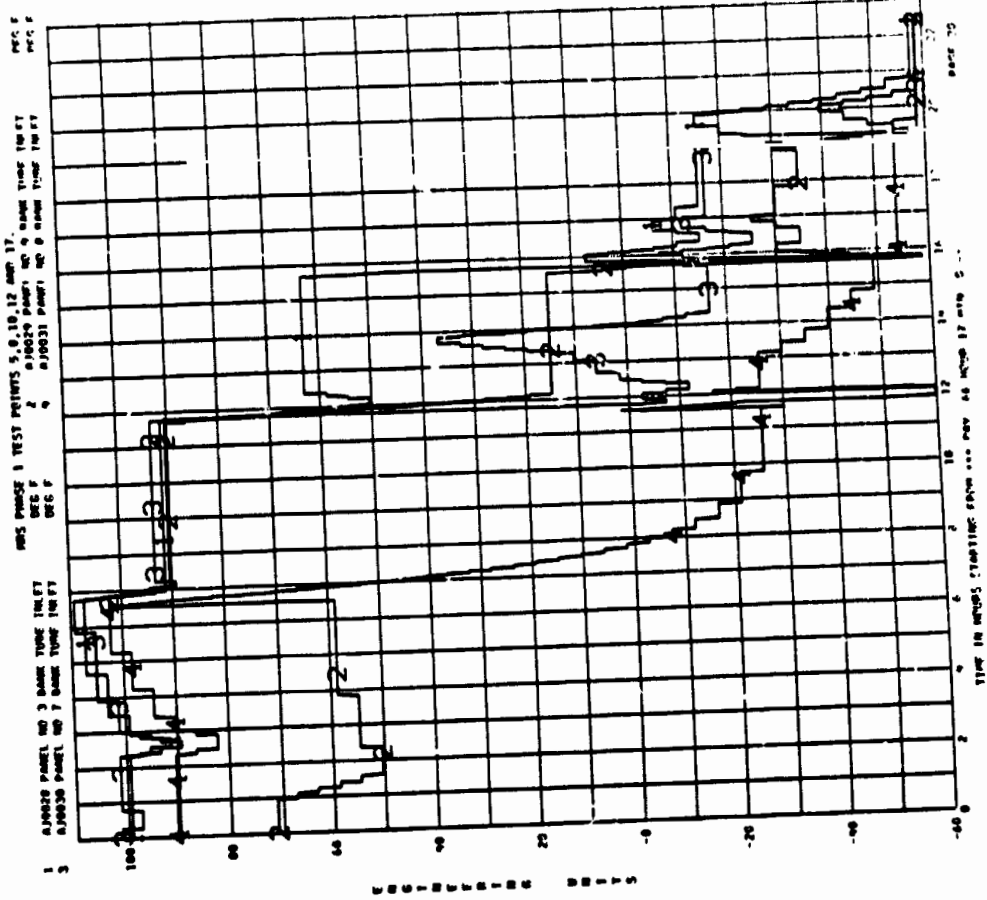


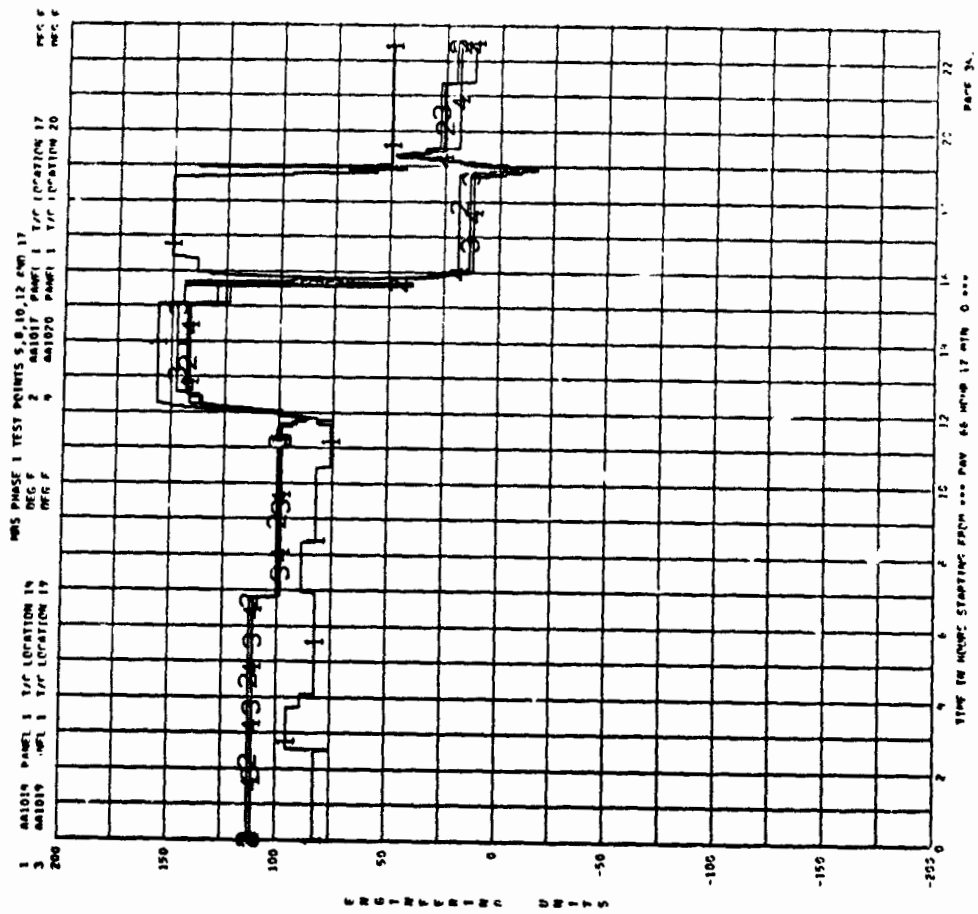
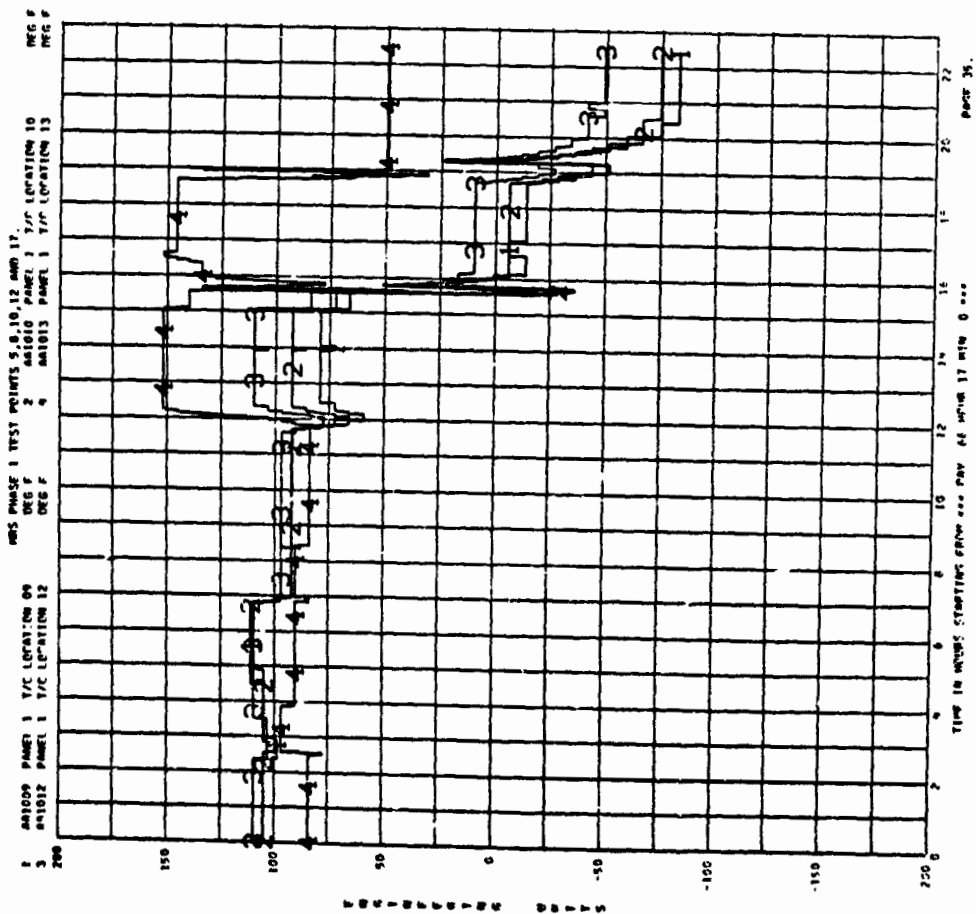


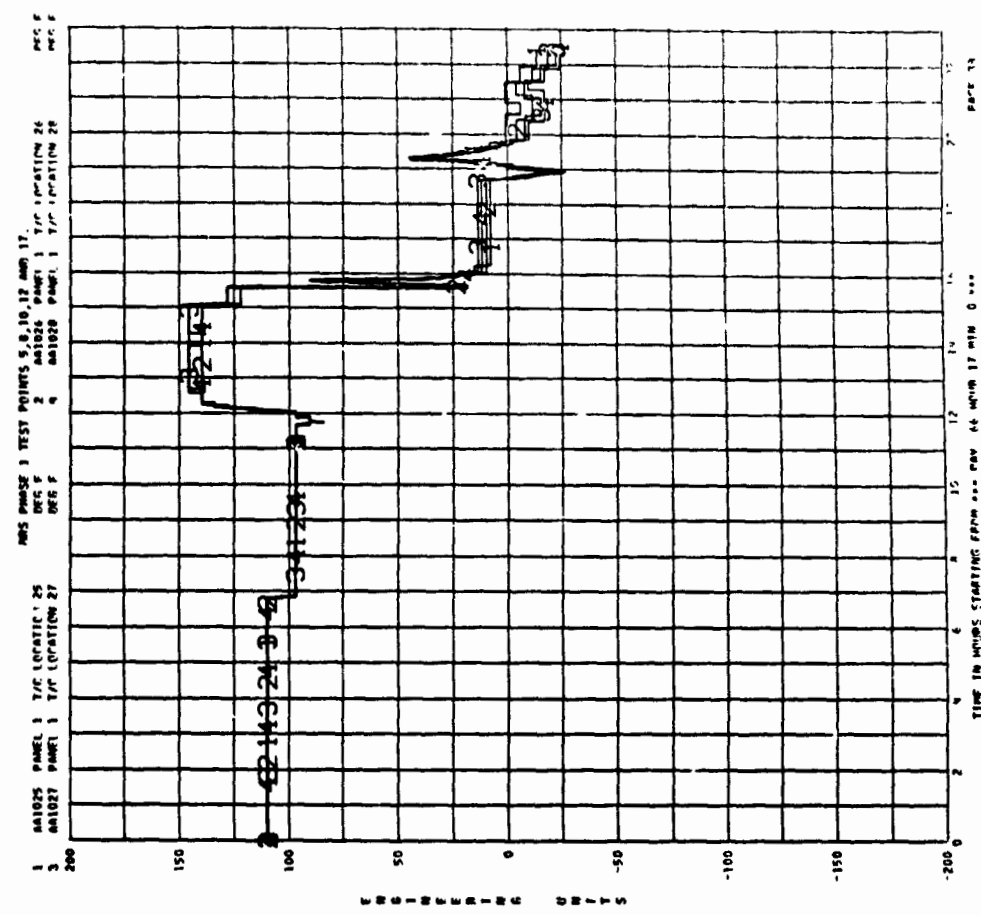
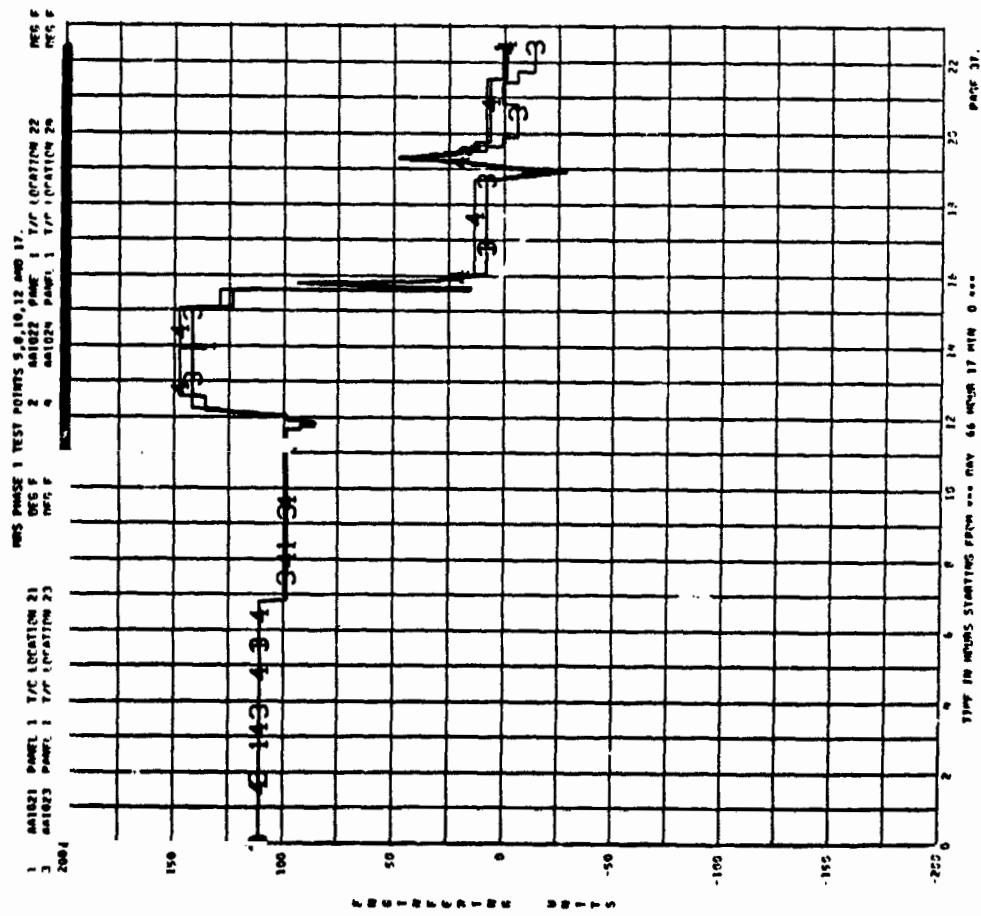


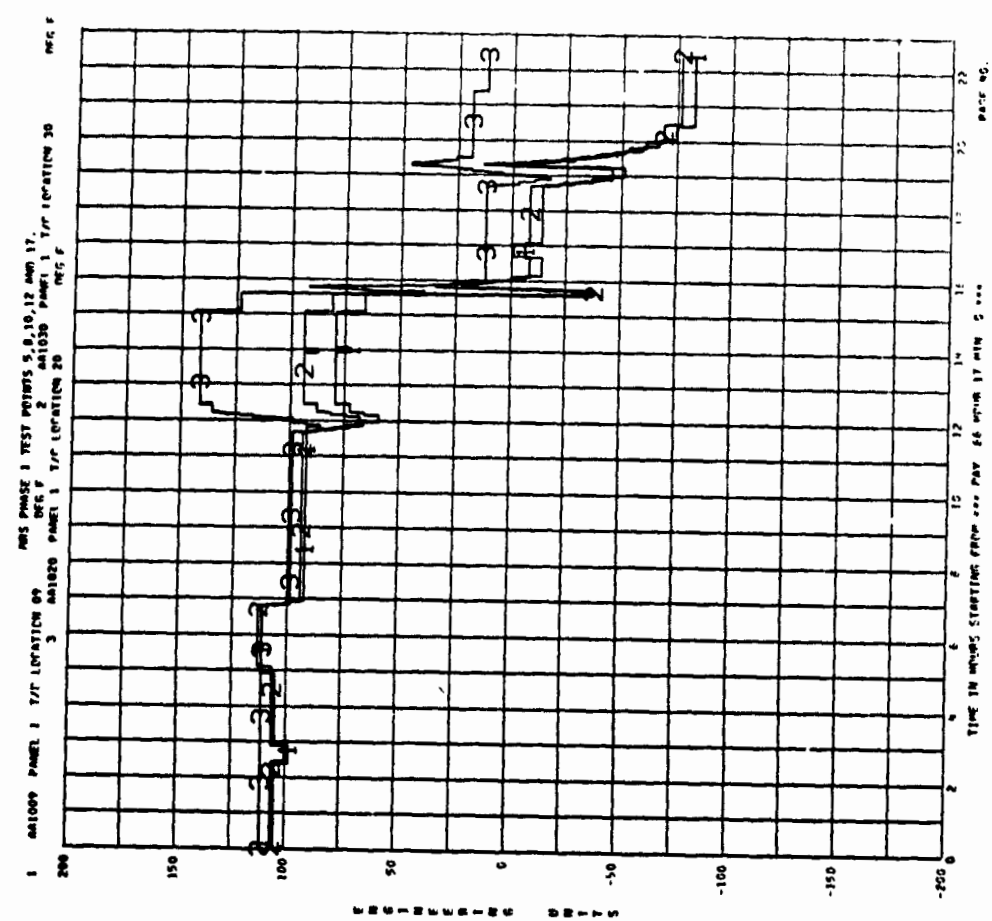
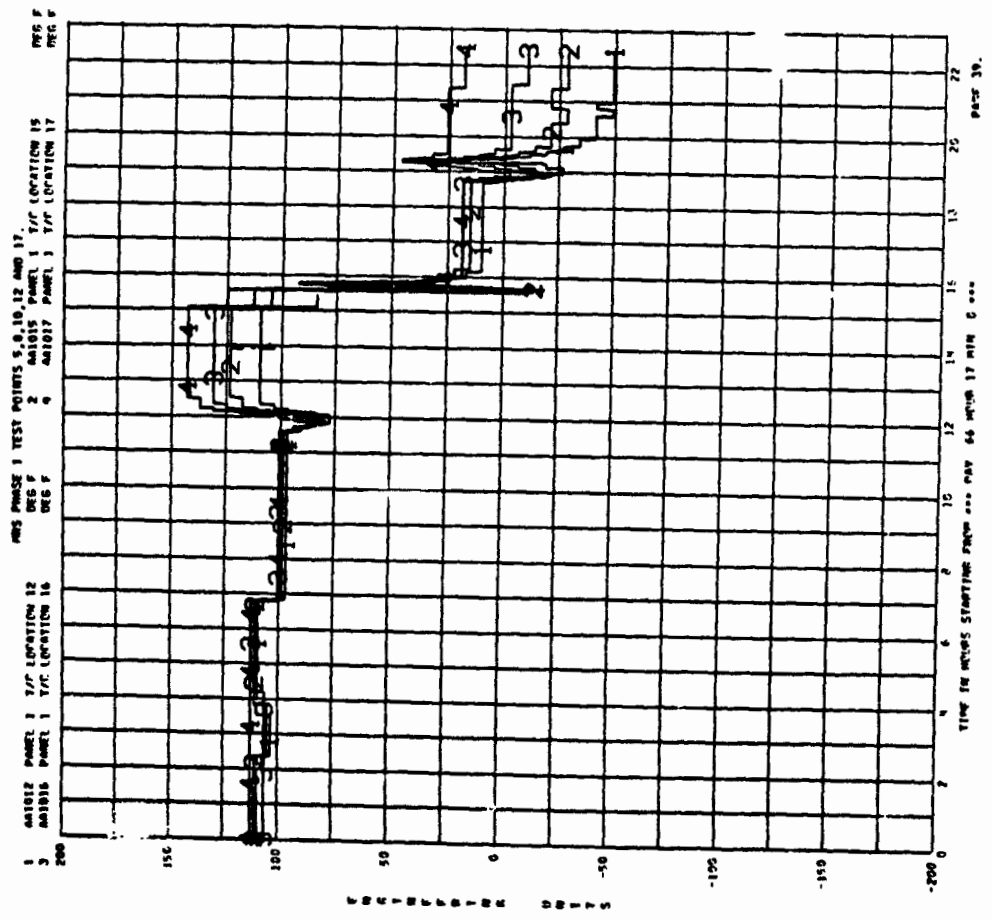


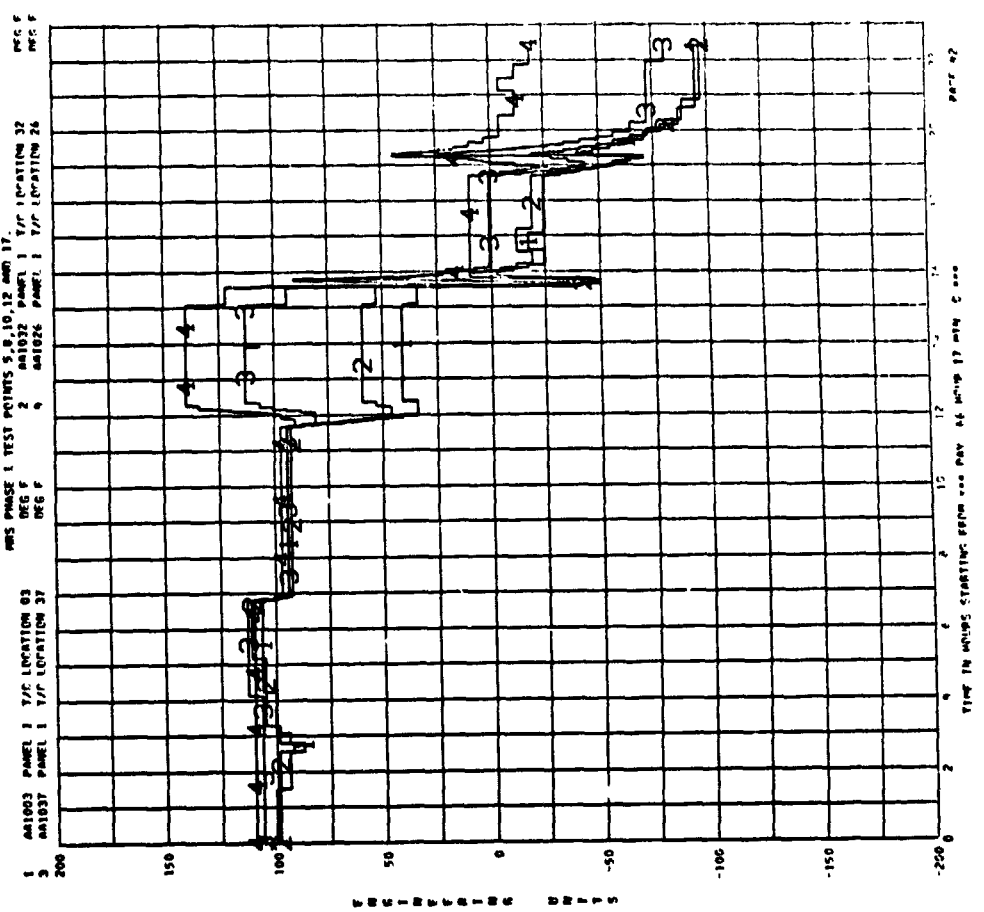
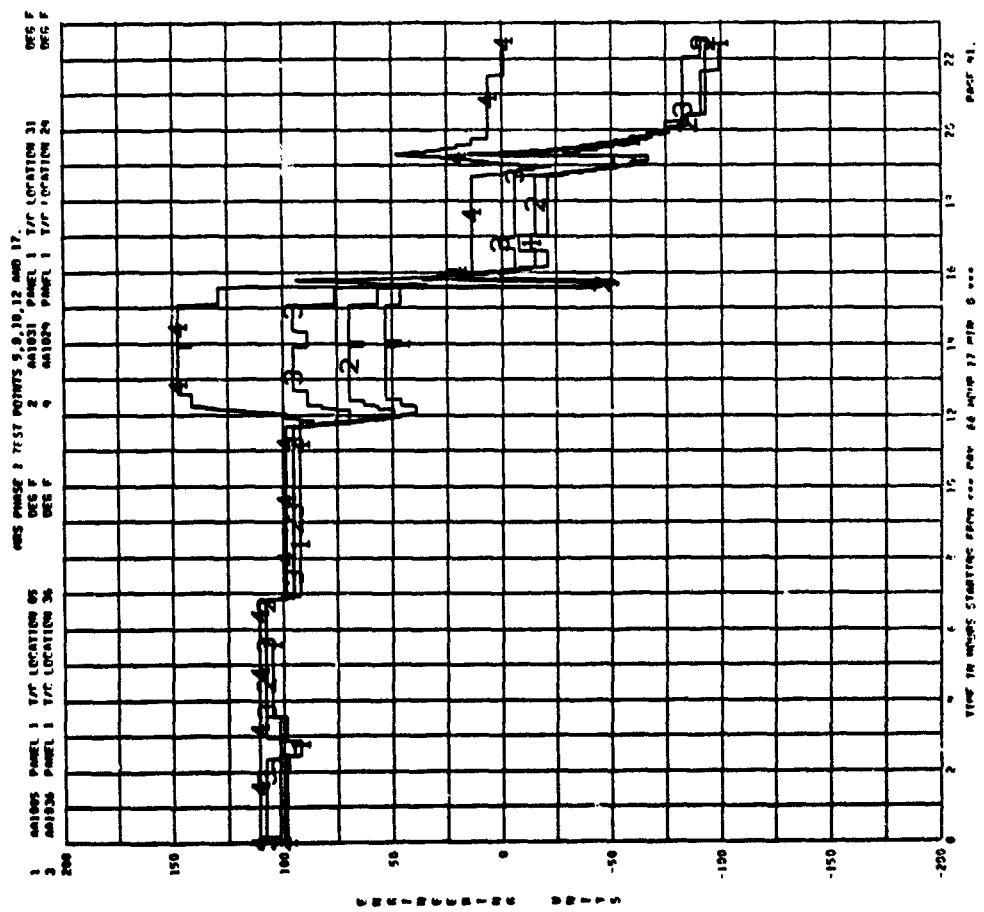


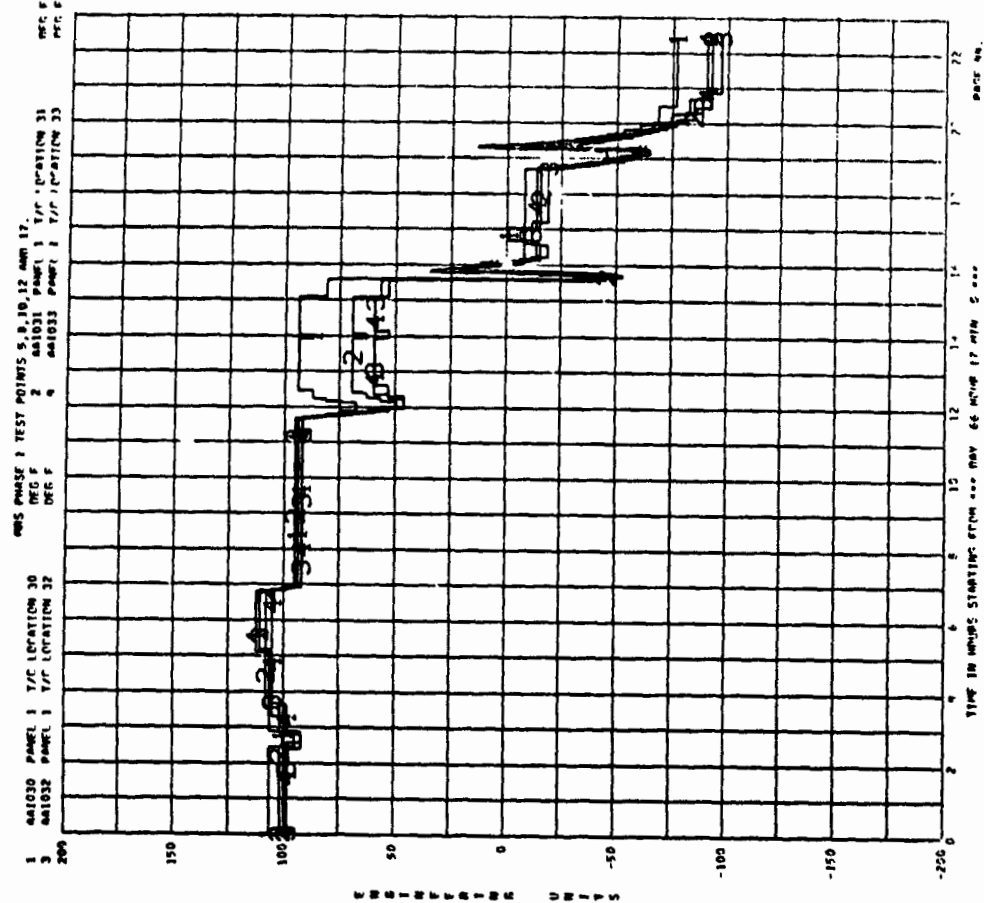
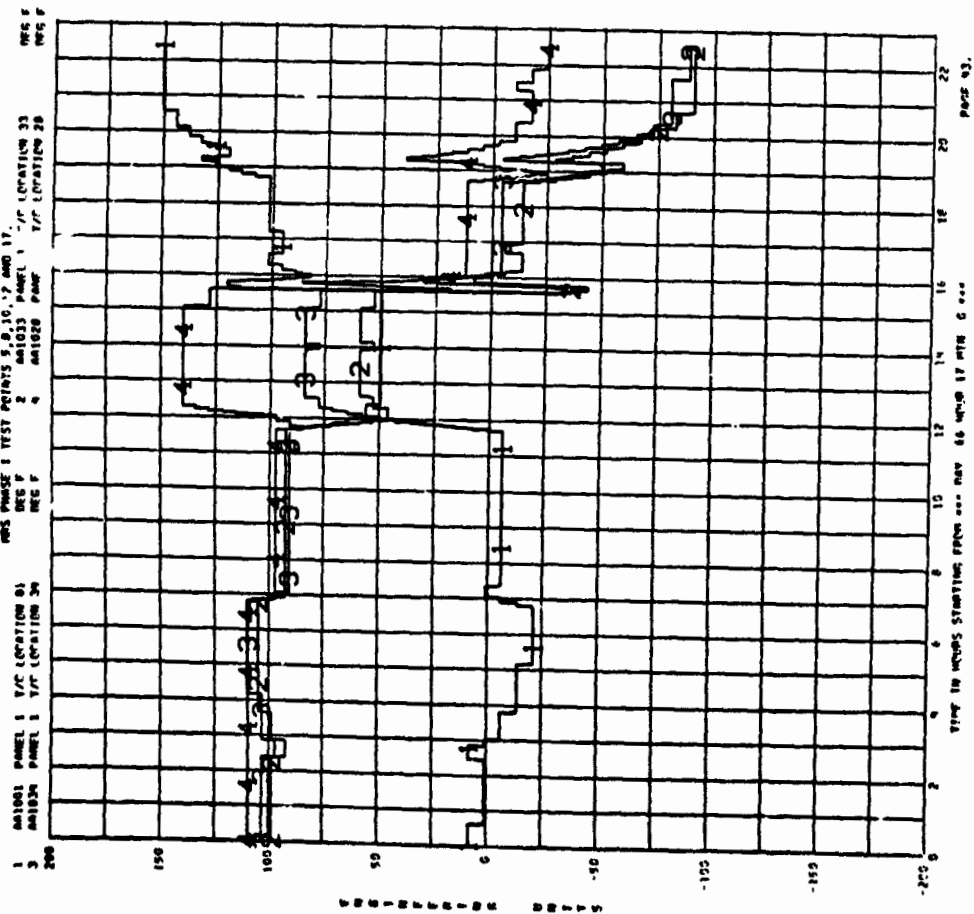




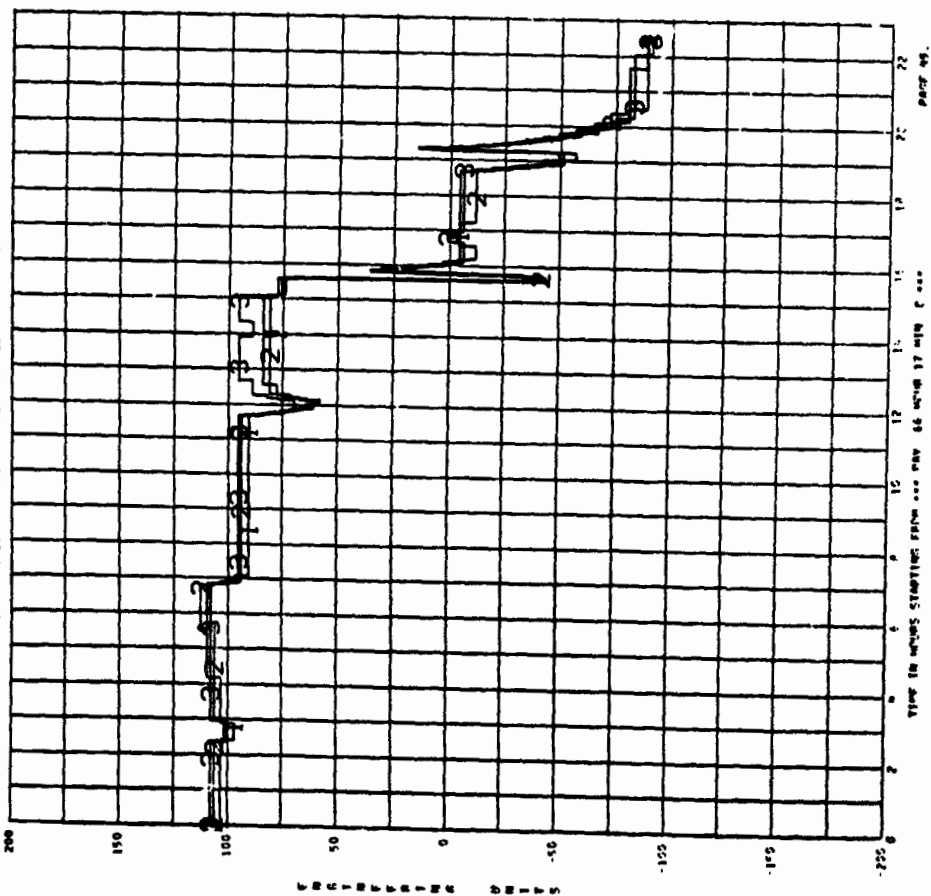






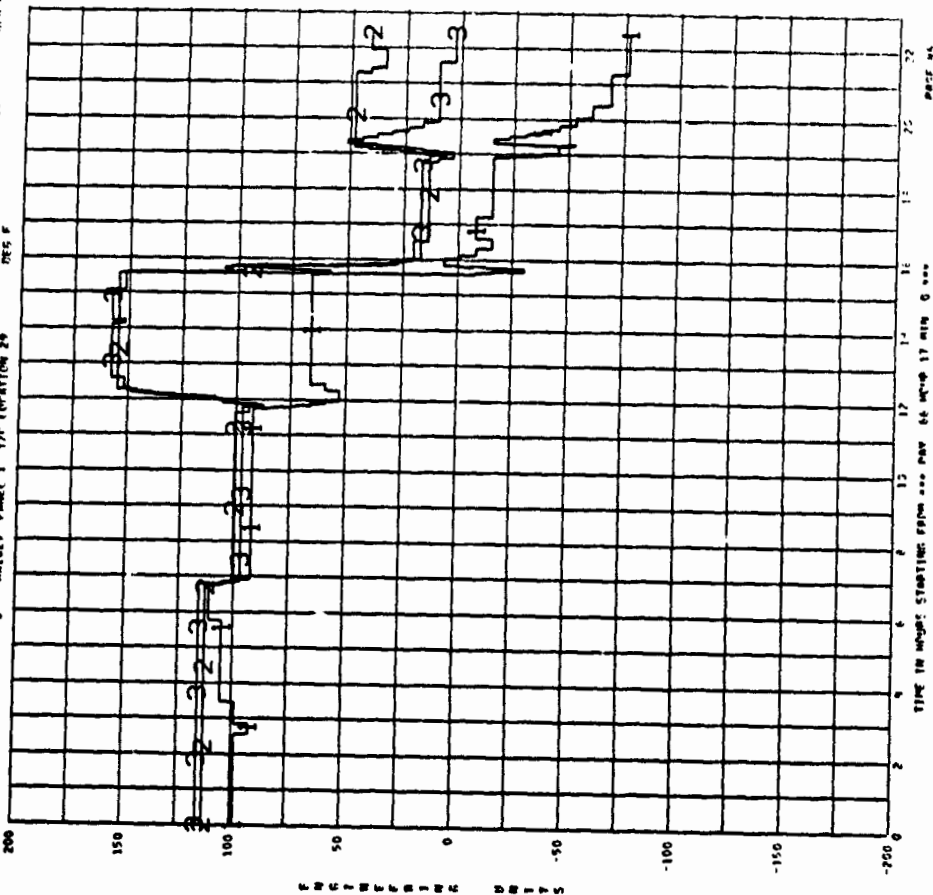


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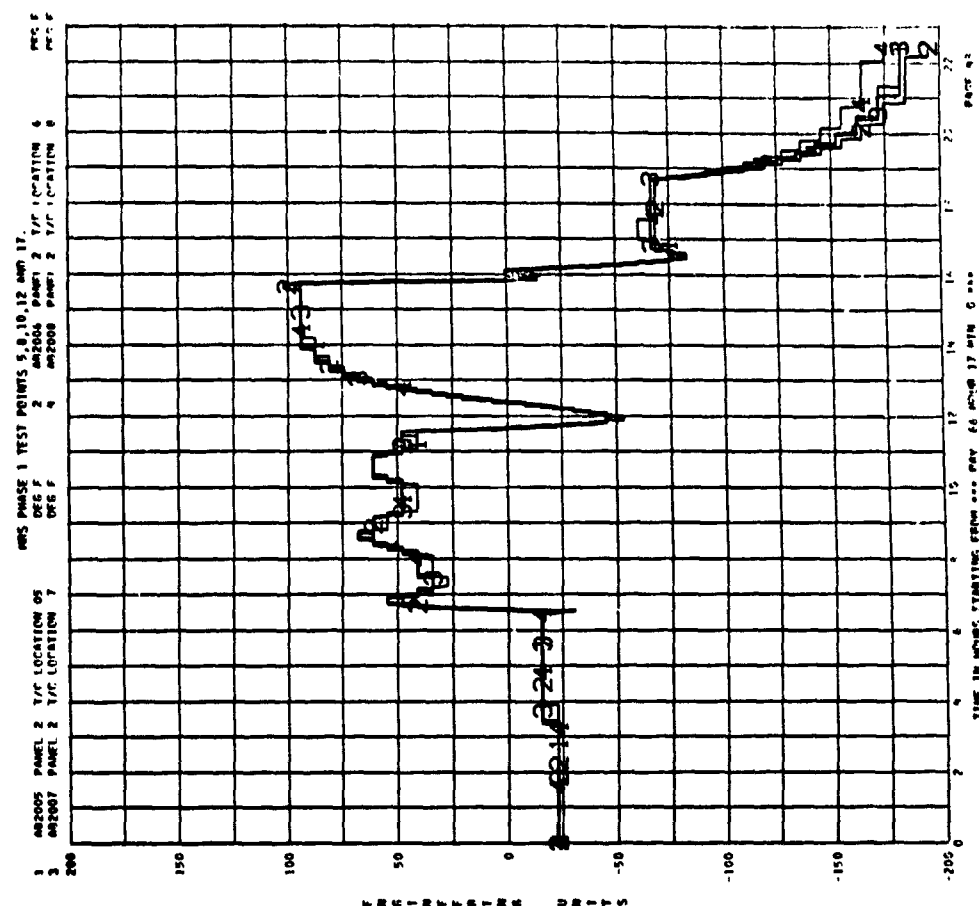
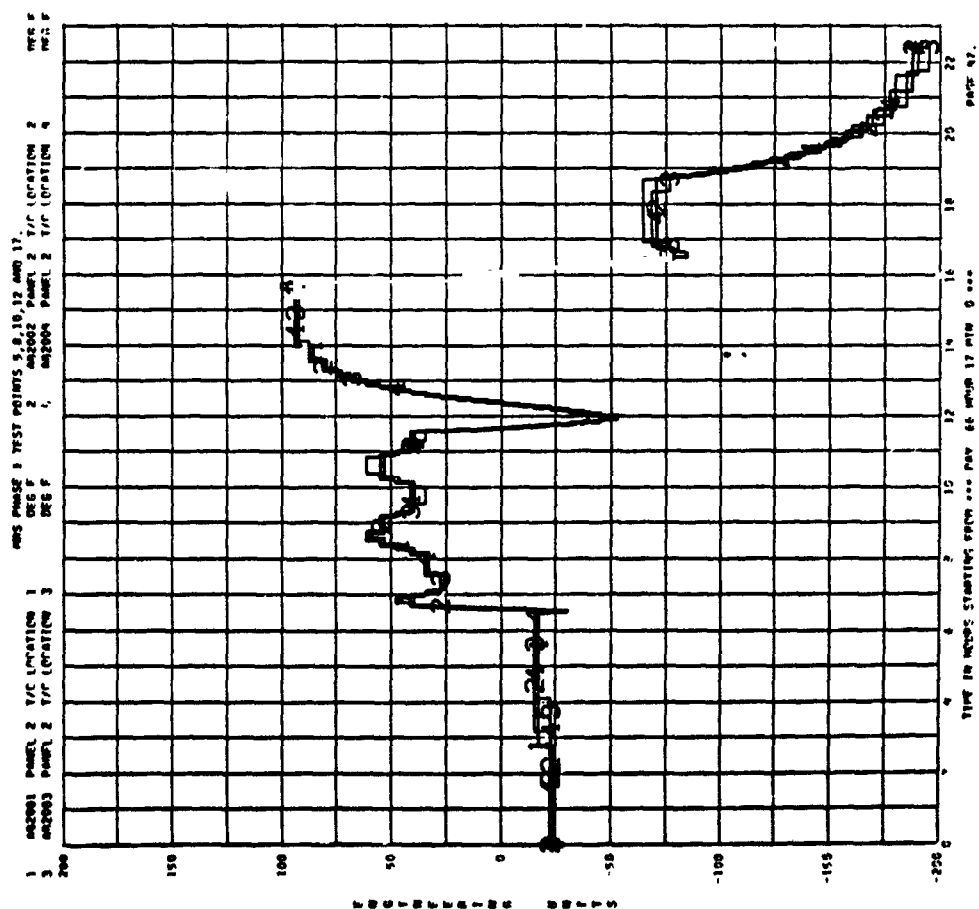


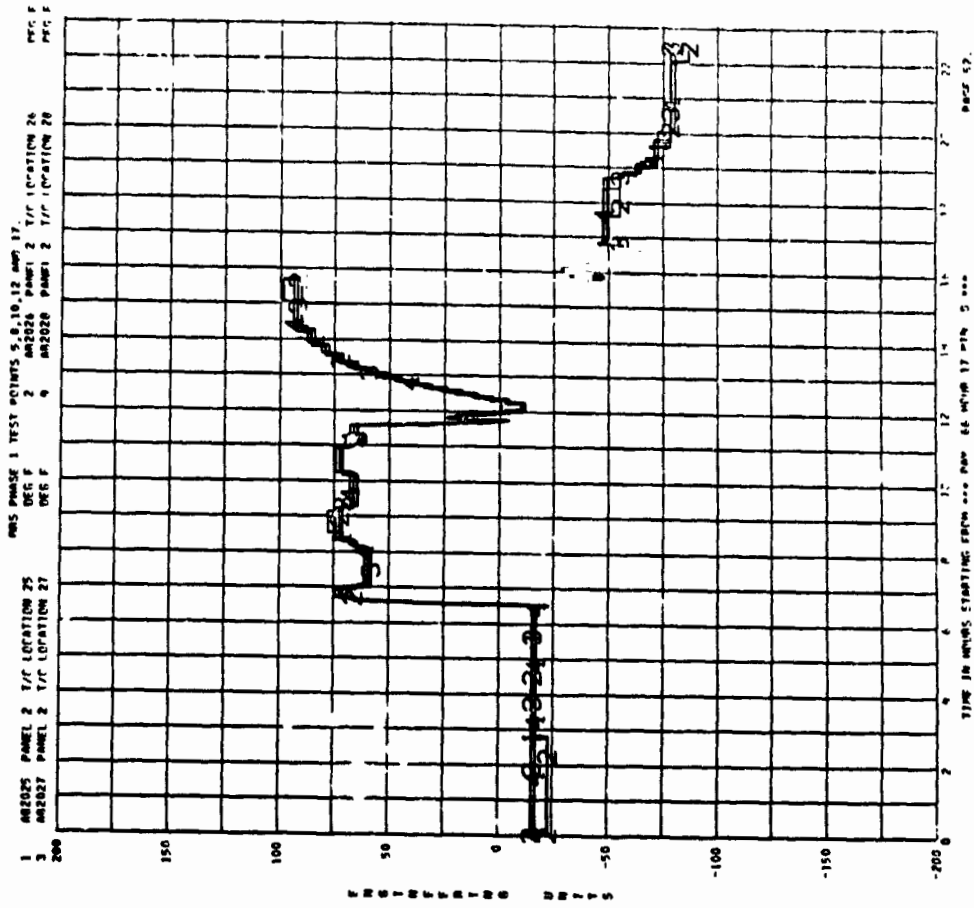
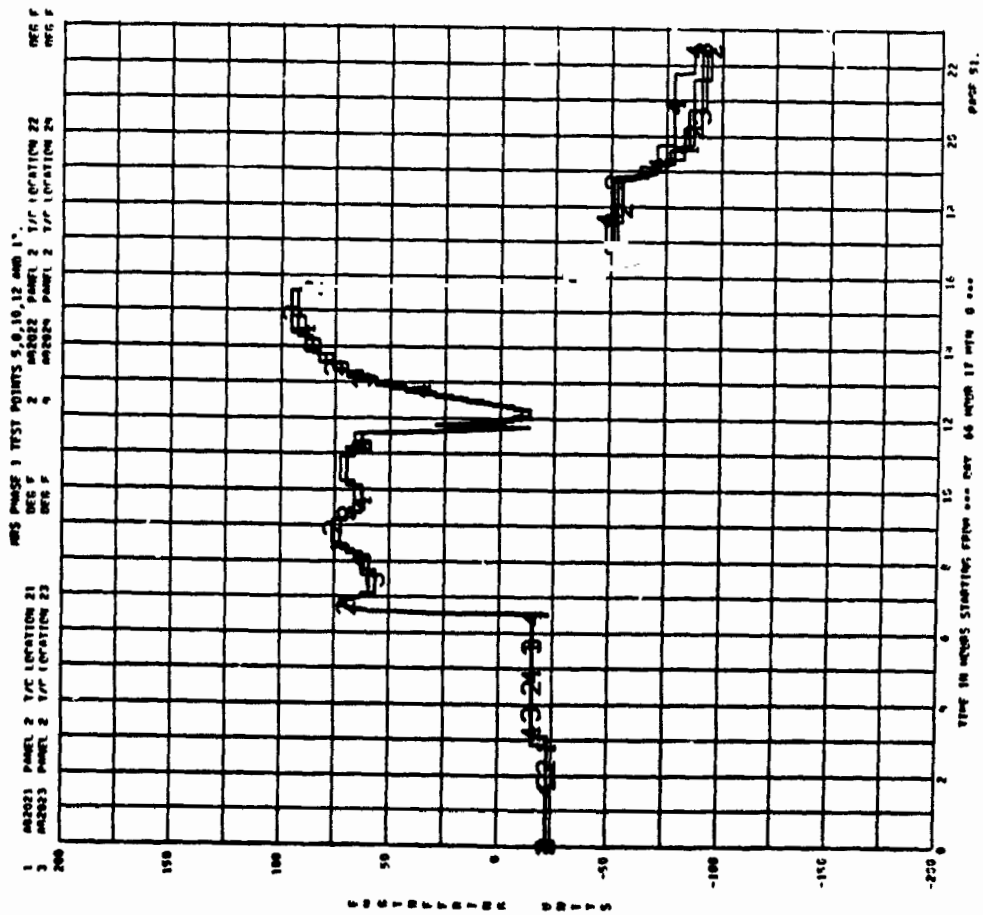
PAGE 48

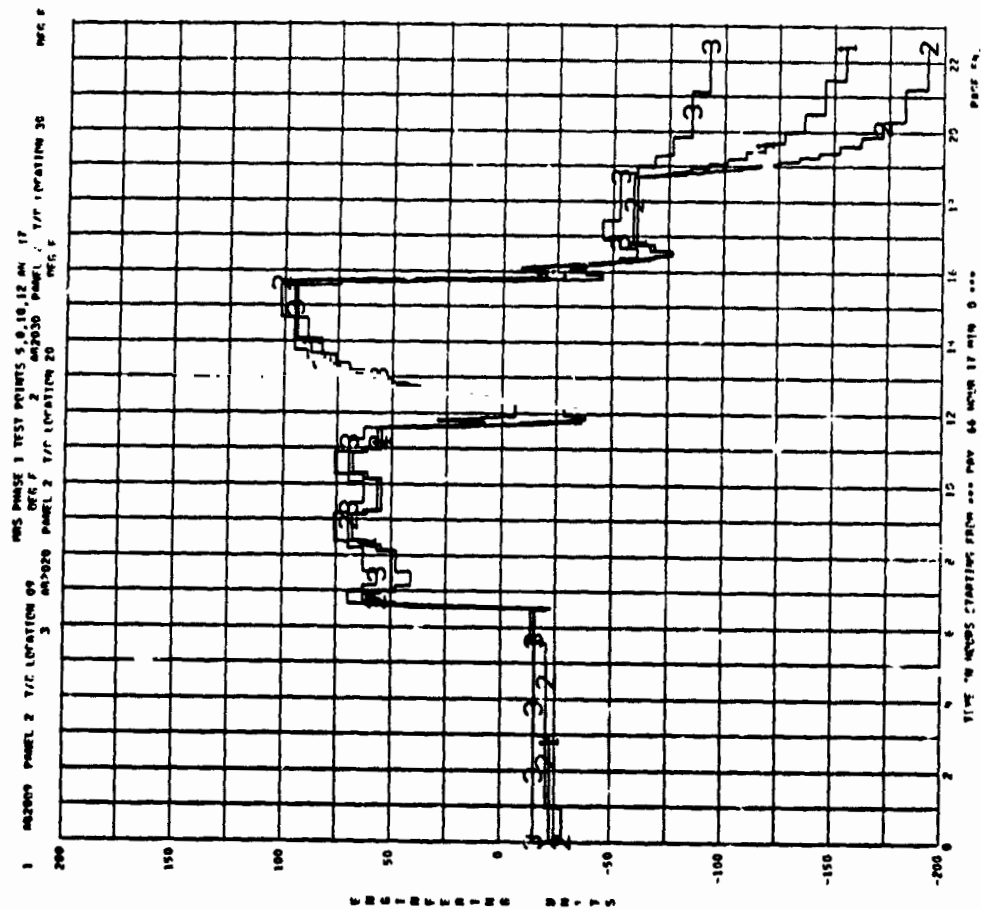
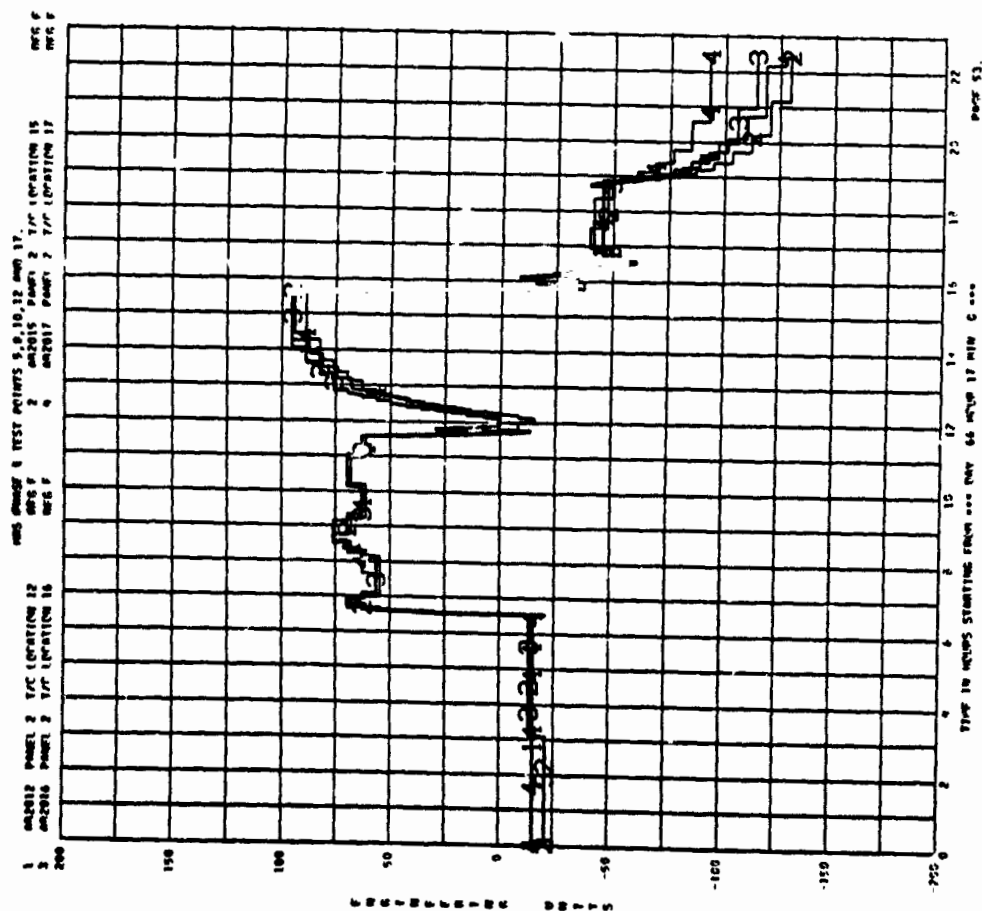
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 63. ARI073 PANEL 1 T/C LOCATION 73
 64. ARI074 PANEL 1 T/C LOCATION 74
 65. ARI075 PANEL 1 T/C LOCATION 75
 66. ARI076 PANEL 1 T/C LOCATION 76
 67. ARI077 PANEL 1 T/C LOCATION 77
 68. ARI078 PANEL 1 T/C LOCATION 78
 69. ARI079 PANEL 1 T/C LOCATION 79
 70. ARI080 PANEL 1 T/C LOCATION 80
 71. ARI081 PANEL 1 T/C LOCATION 81
 72. ARI082 PANEL 1 T/C LOCATION 82
 73. ARI083 PANEL 1 T/C LOCATION 83
 74. ARI084 PANEL 1 T/C LOCATION 84
 75. ARI085 PANEL 1 T/C LOCATION 85
 76. ARI086 PANEL 1 T/C LOCATION 86
 77. ARI087 PANEL 1 T/C LOCATION 87
 78. ARI088 PANEL 1 T/C LOCATION 88
 79. ARI089 PANEL 1 T/C LOCATION 89
 80. ARI090 PANEL 1 T/C LOCATION 90
 81. ARI091 PANEL 1 T/C LOCATION 91
 82. ARI092 PANEL 1 T/C LOCATION 92
 83. ARI093 PANEL 1 T/C LOCATION 93
 84. ARI094 PANEL 1 T/C LOCATION 94
 85. ARI095 PANEL 1 T/C LOCATION 95
 86. ARI096 PANEL 1 T/C LOCATION 96
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 89. ARI099 PANEL 1 T/C LOCATION 99
 90. ARI100 PANEL 1 T/C LOCATION 100

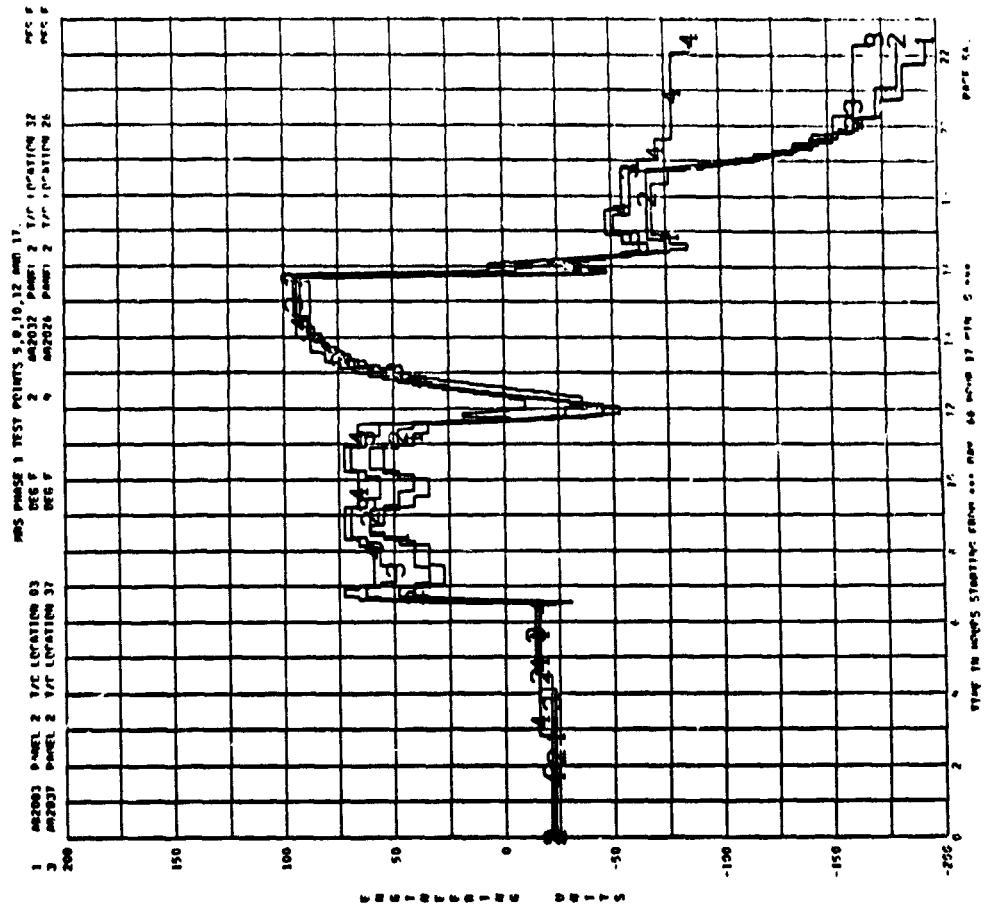
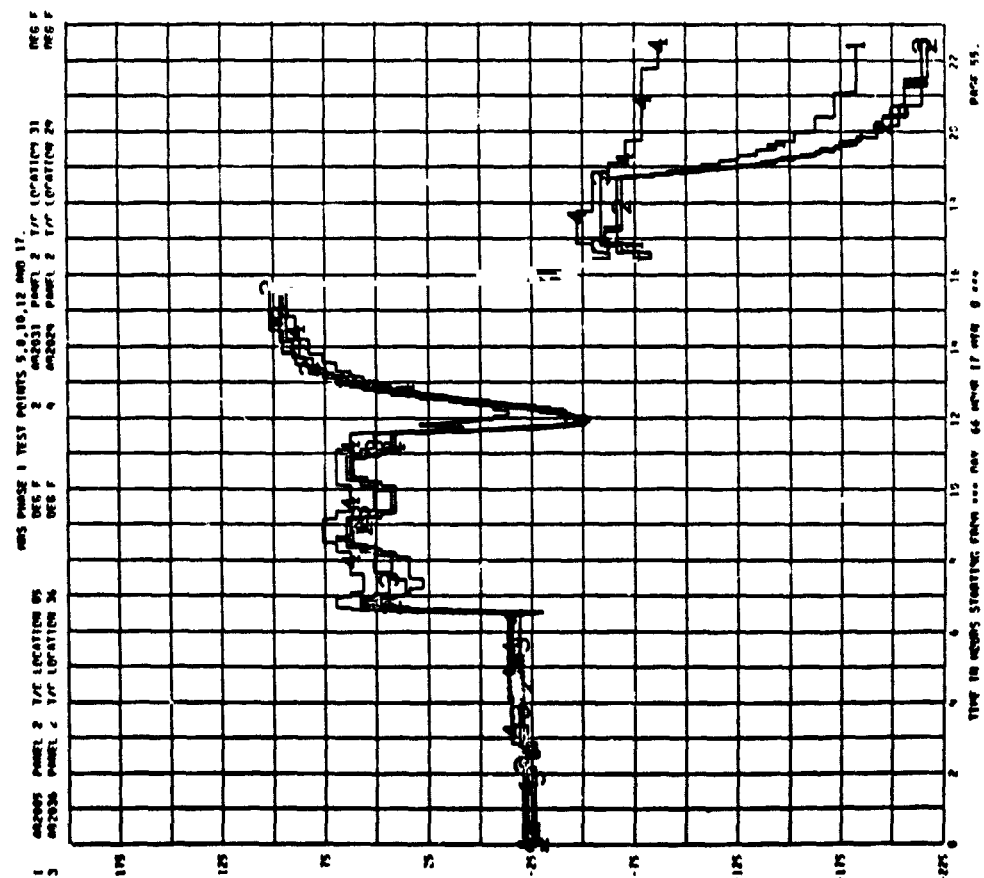


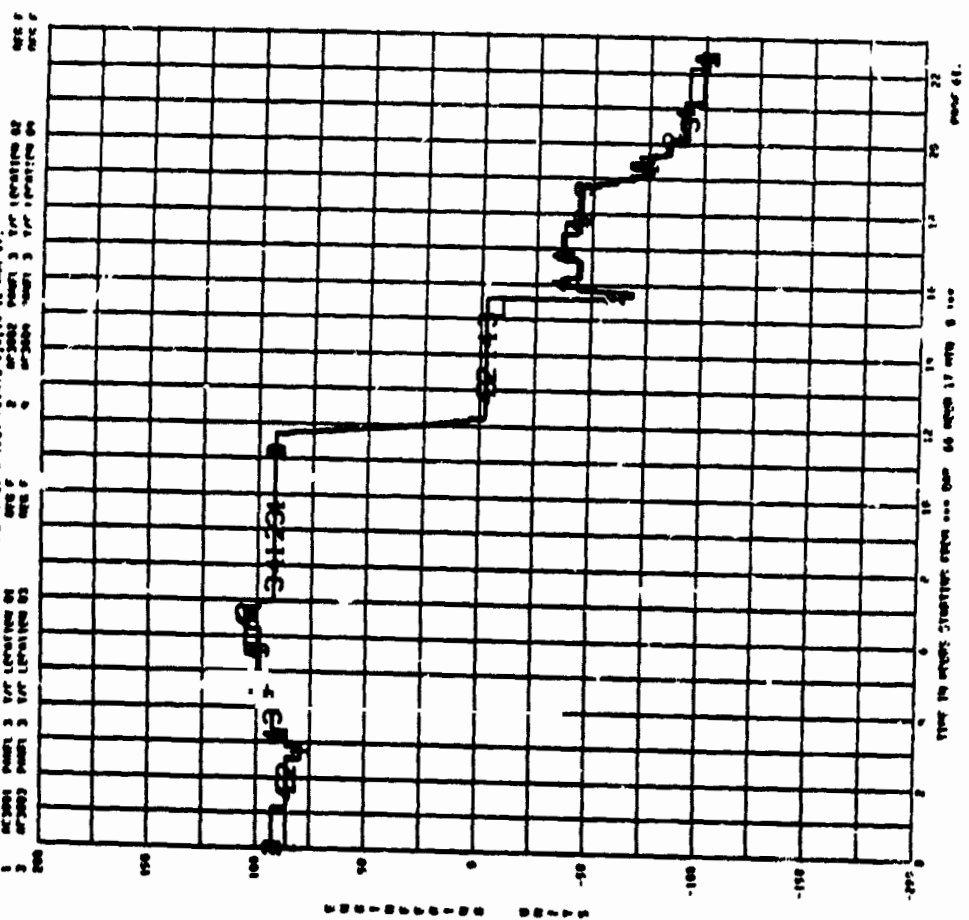
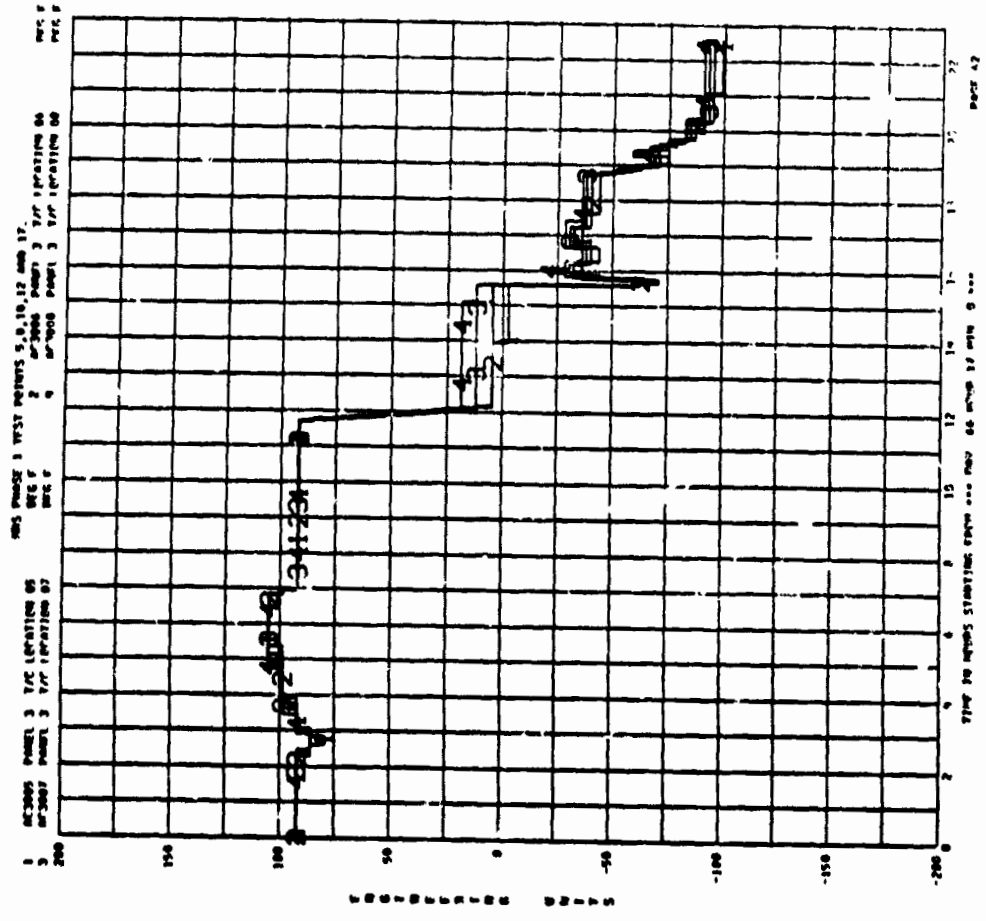
PAGE 49

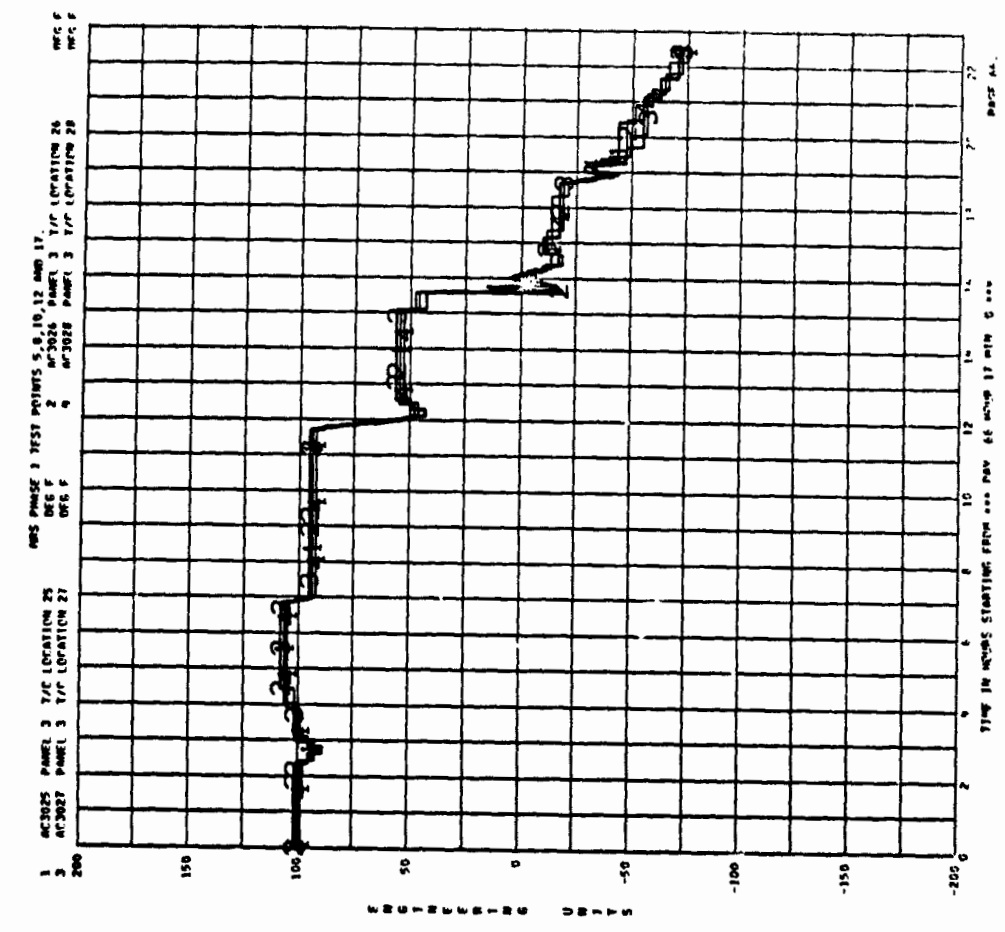
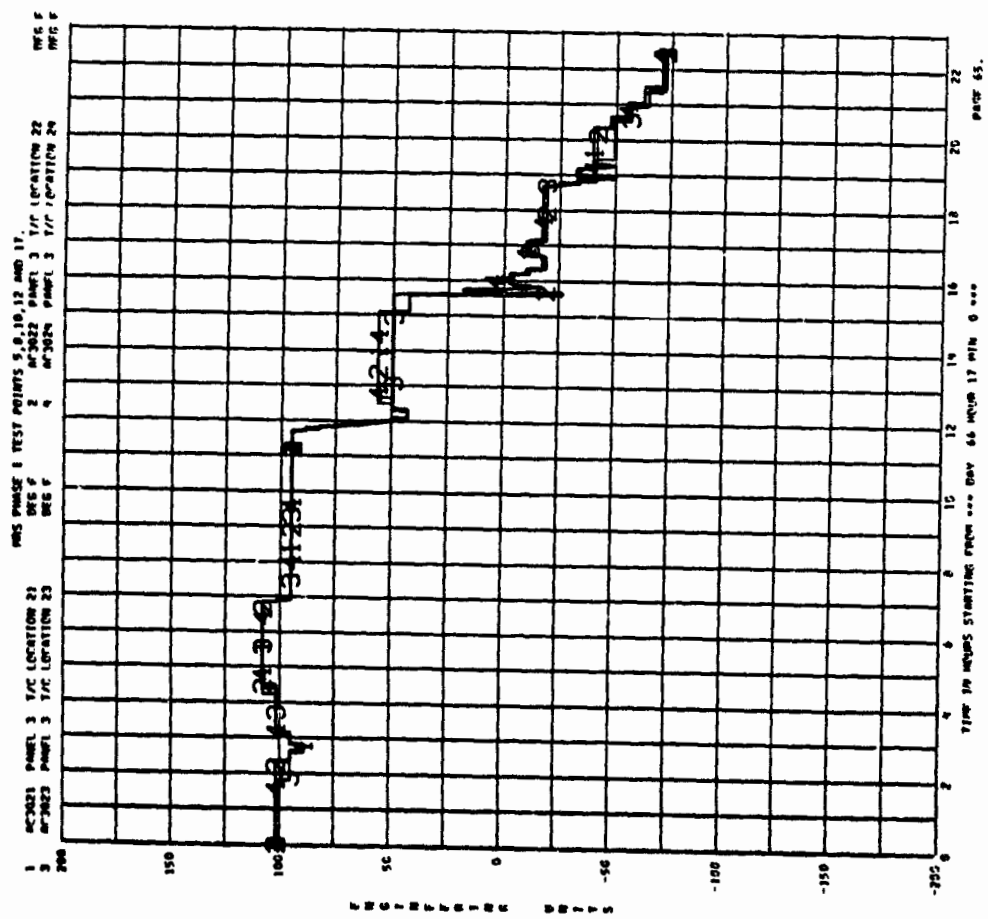


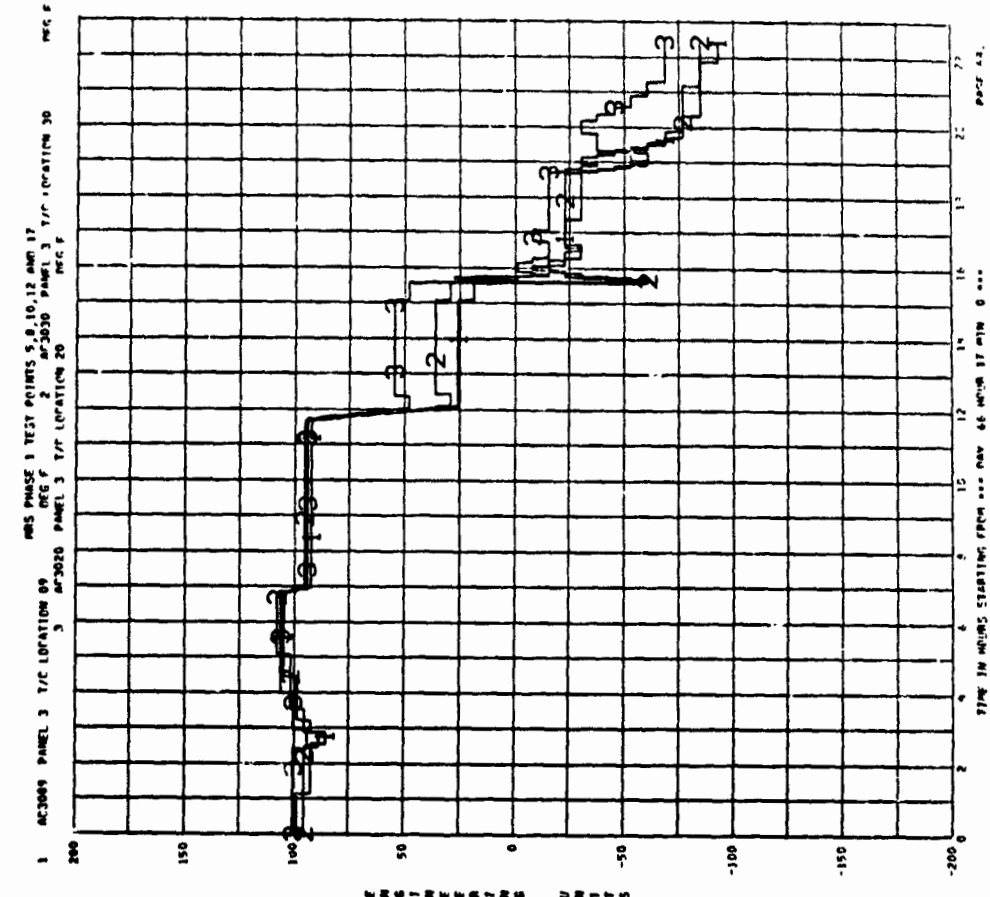
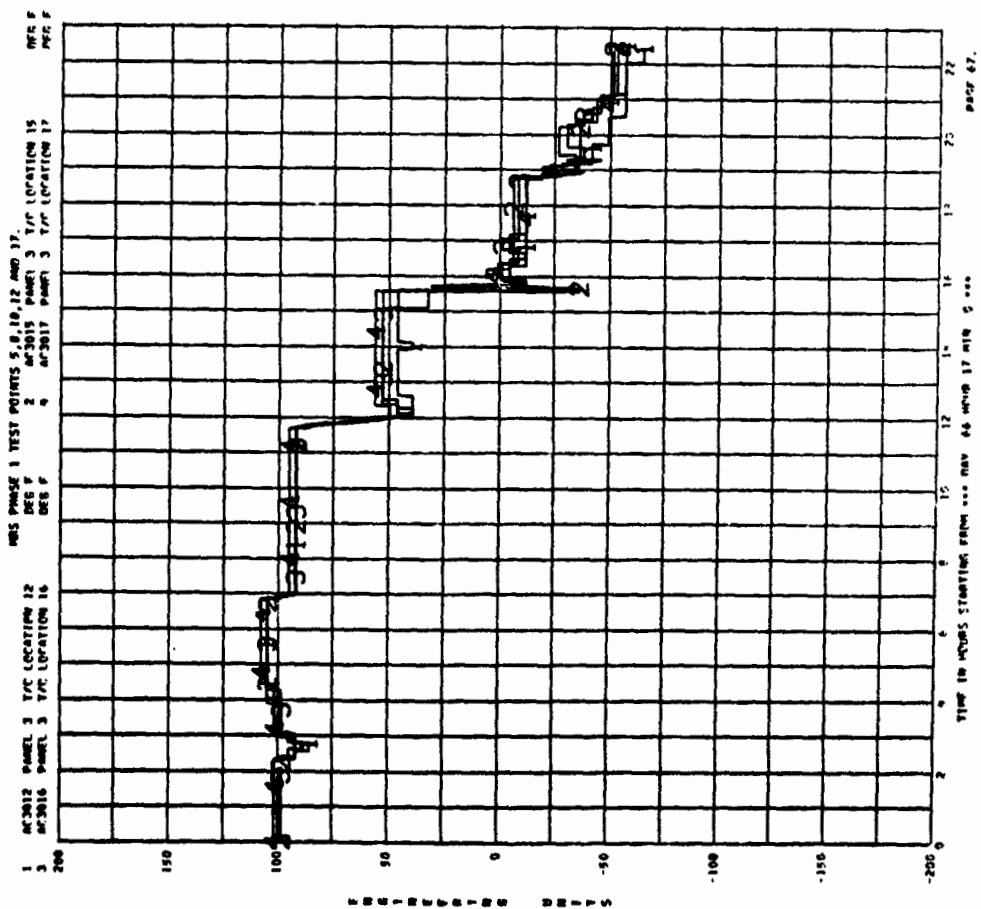


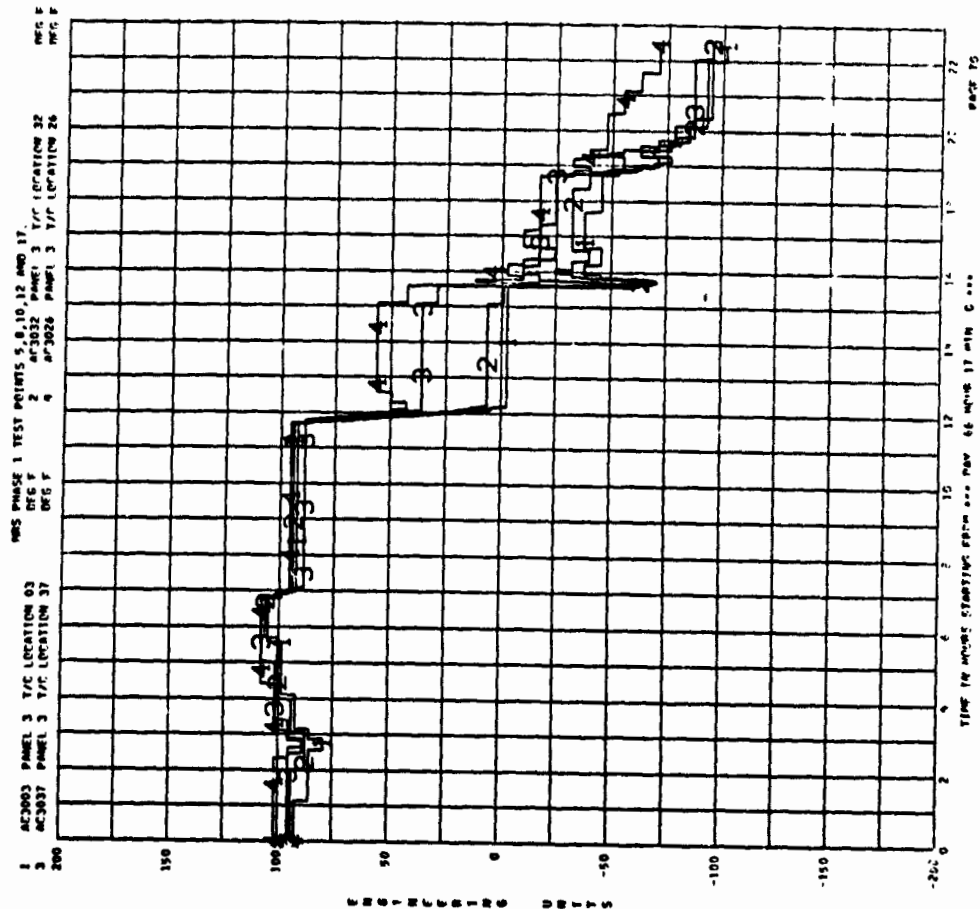
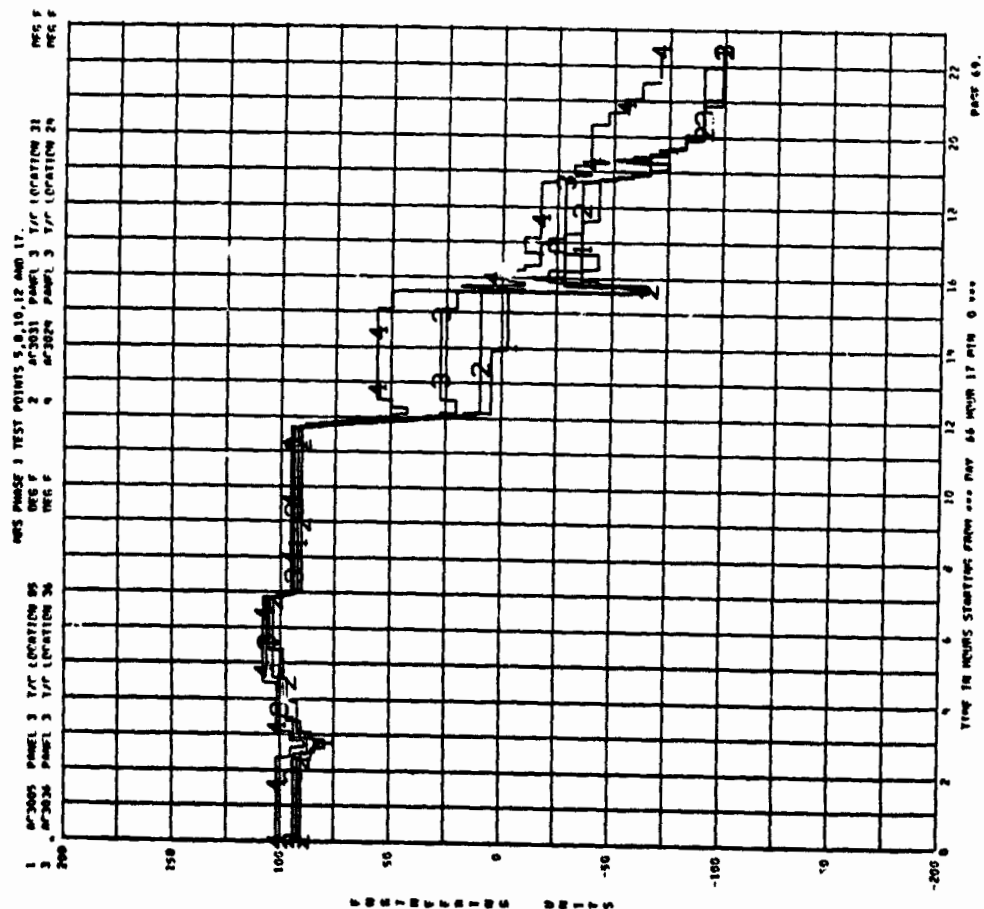


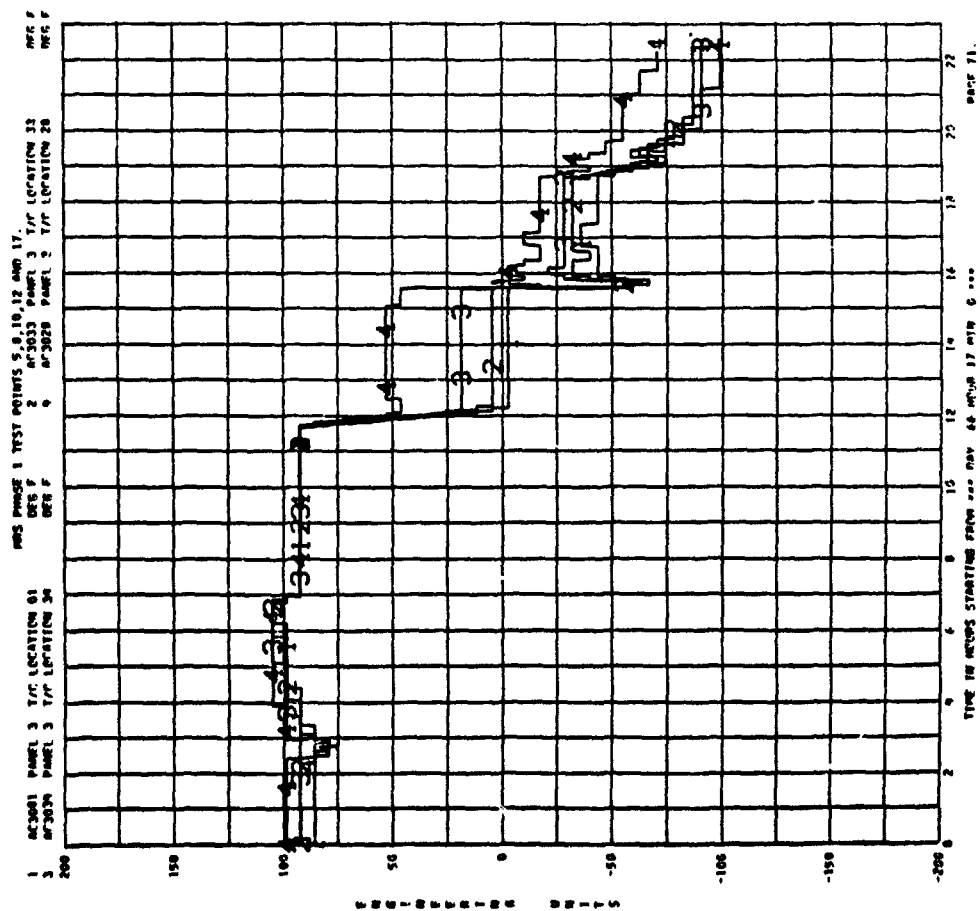
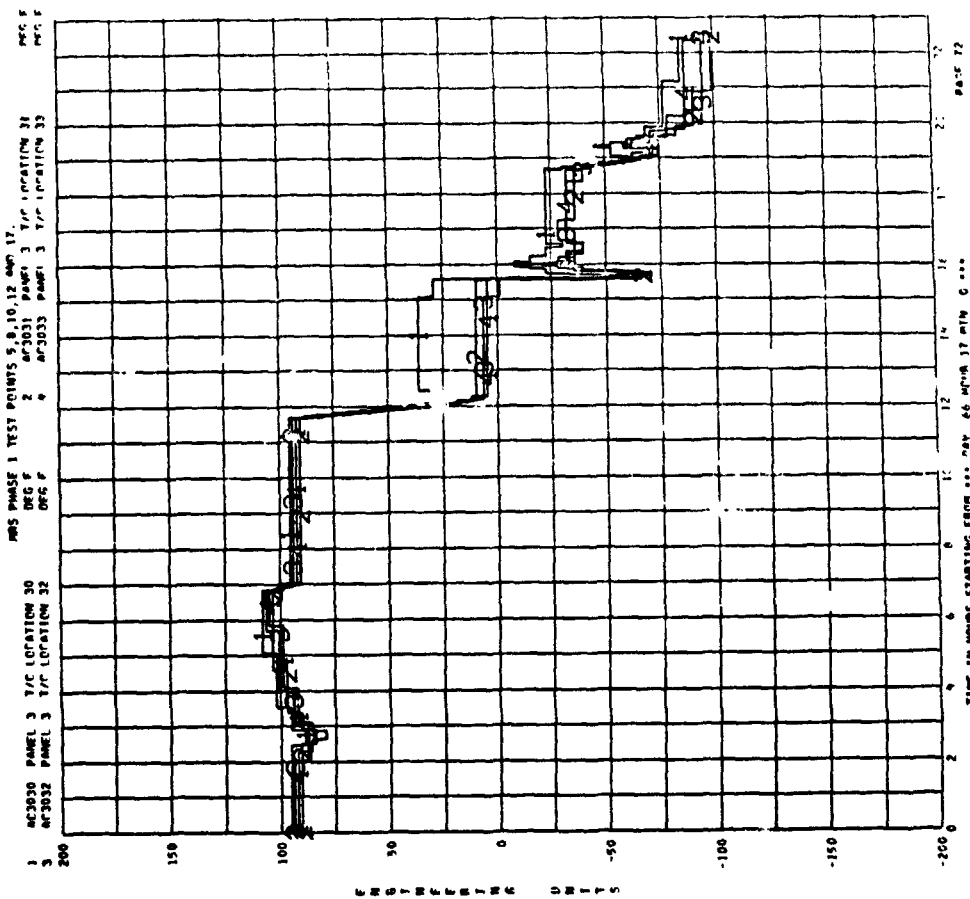


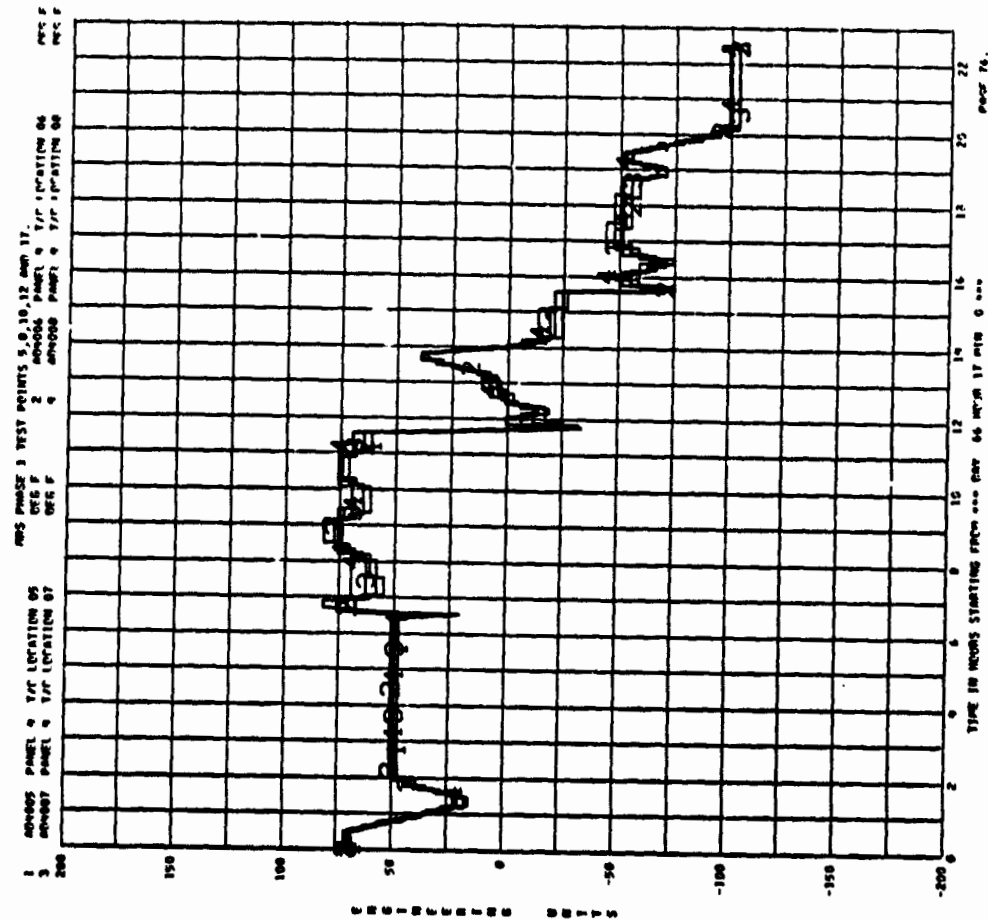
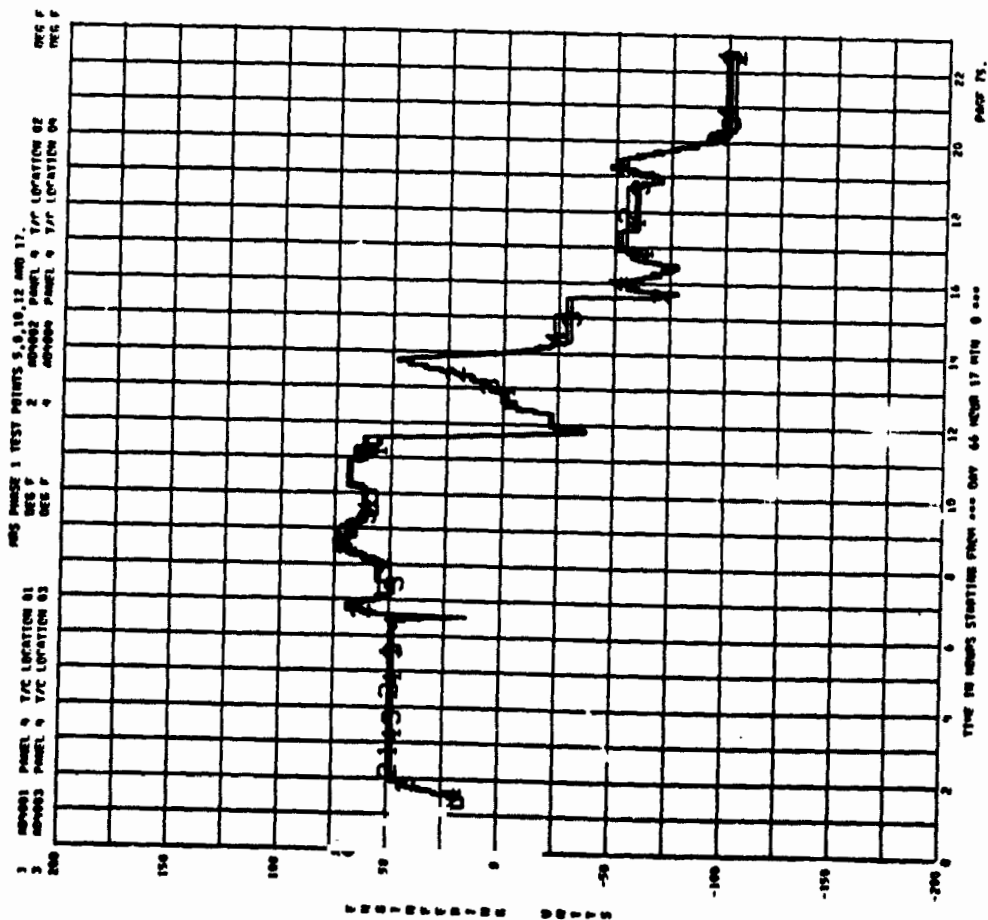


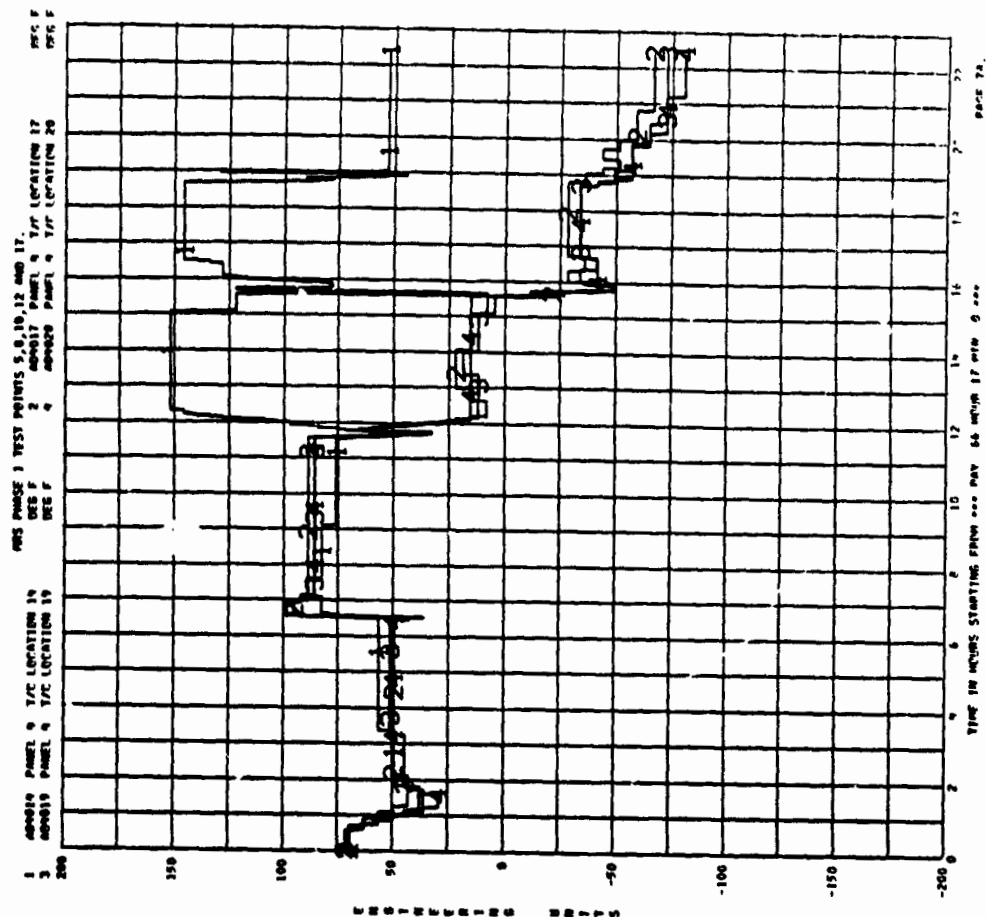
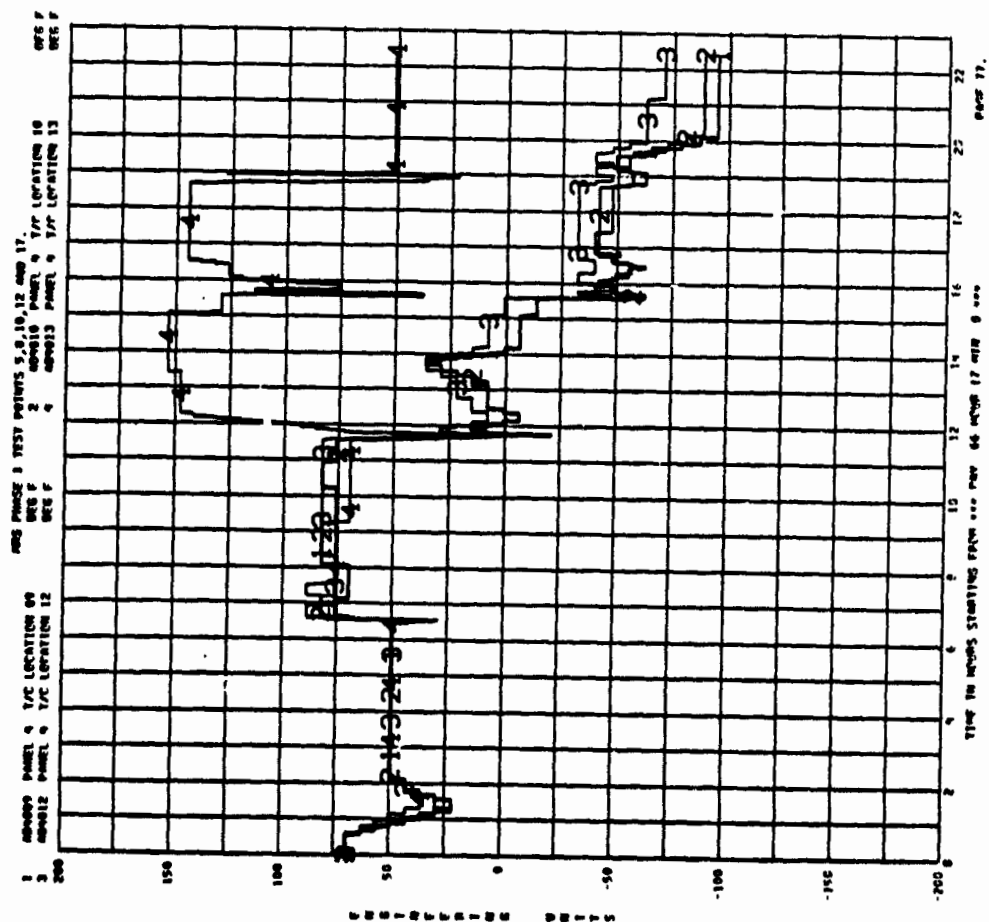


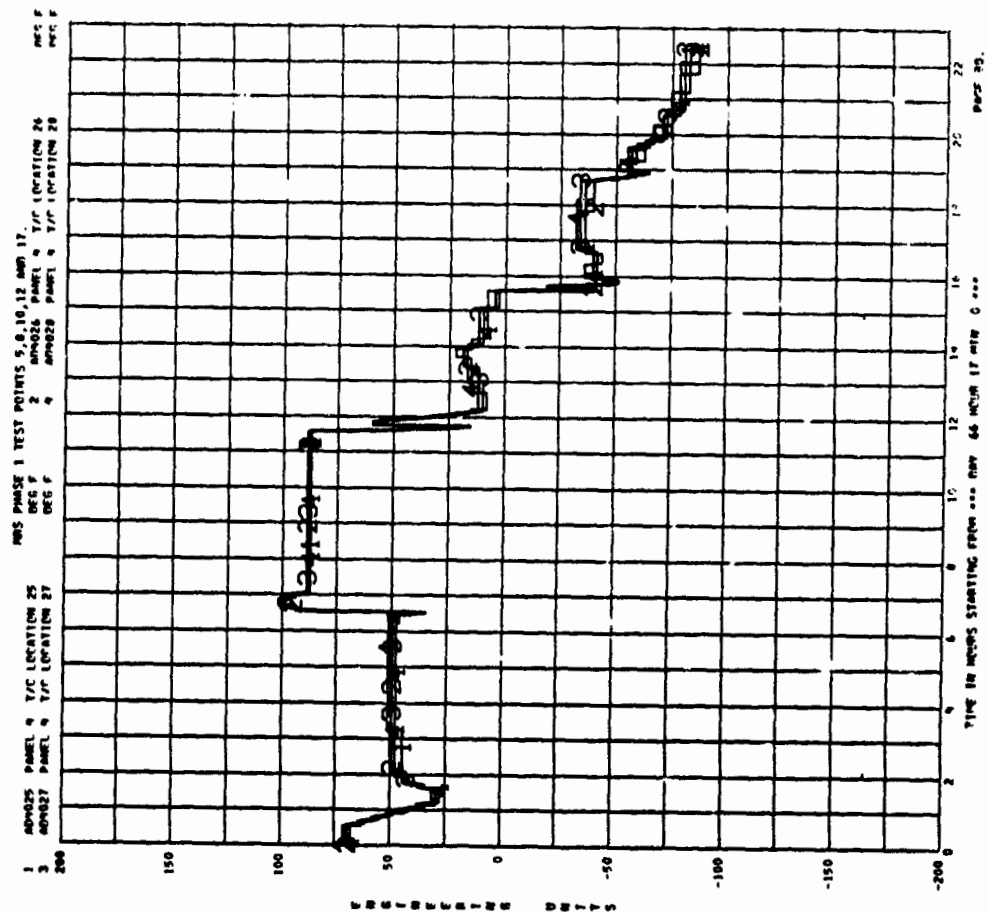
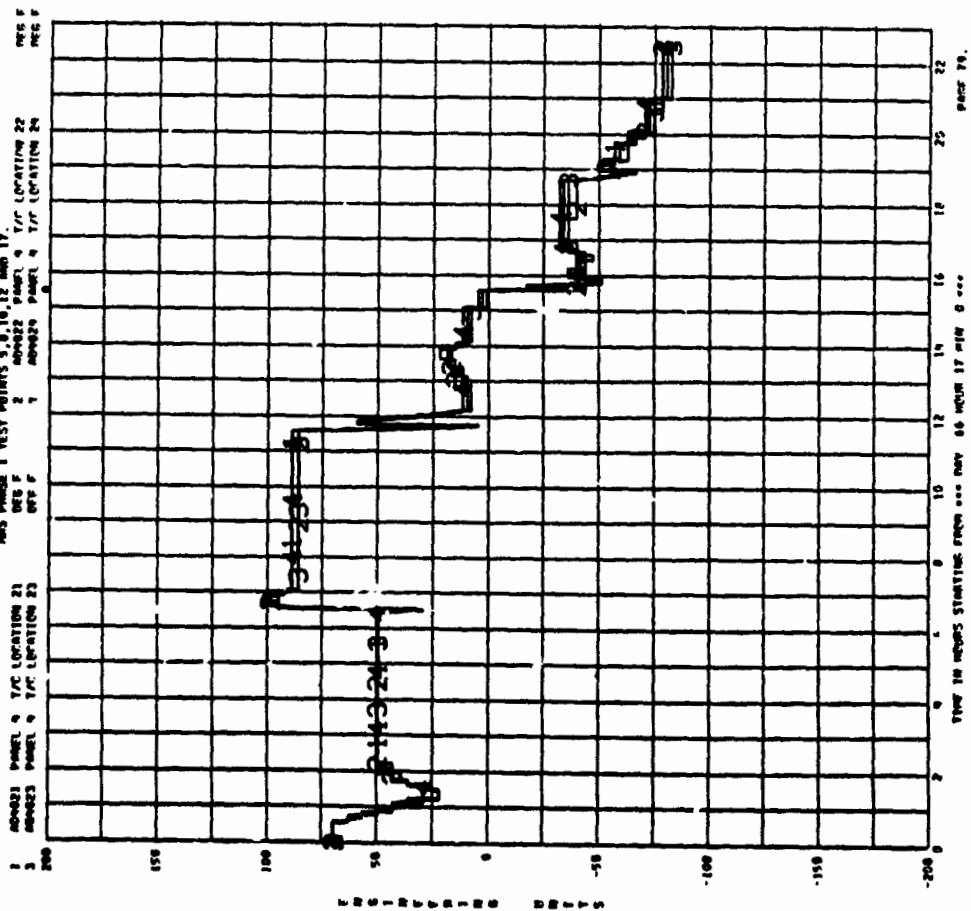


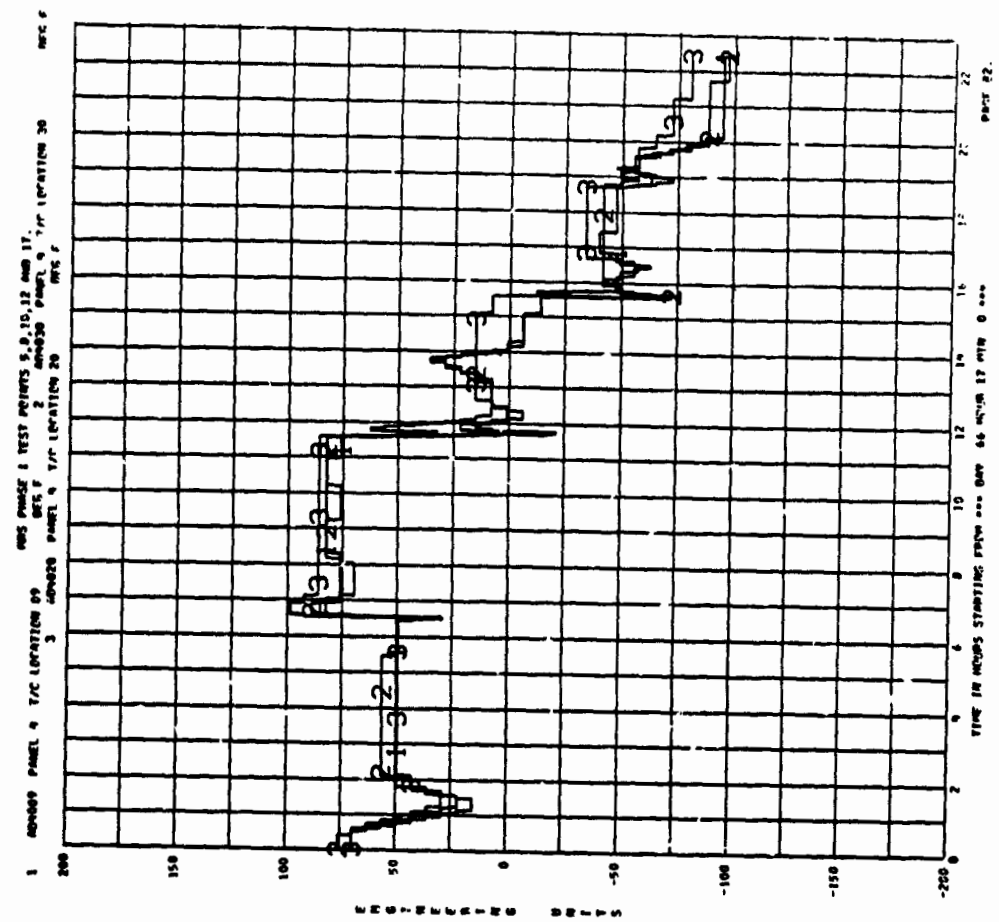
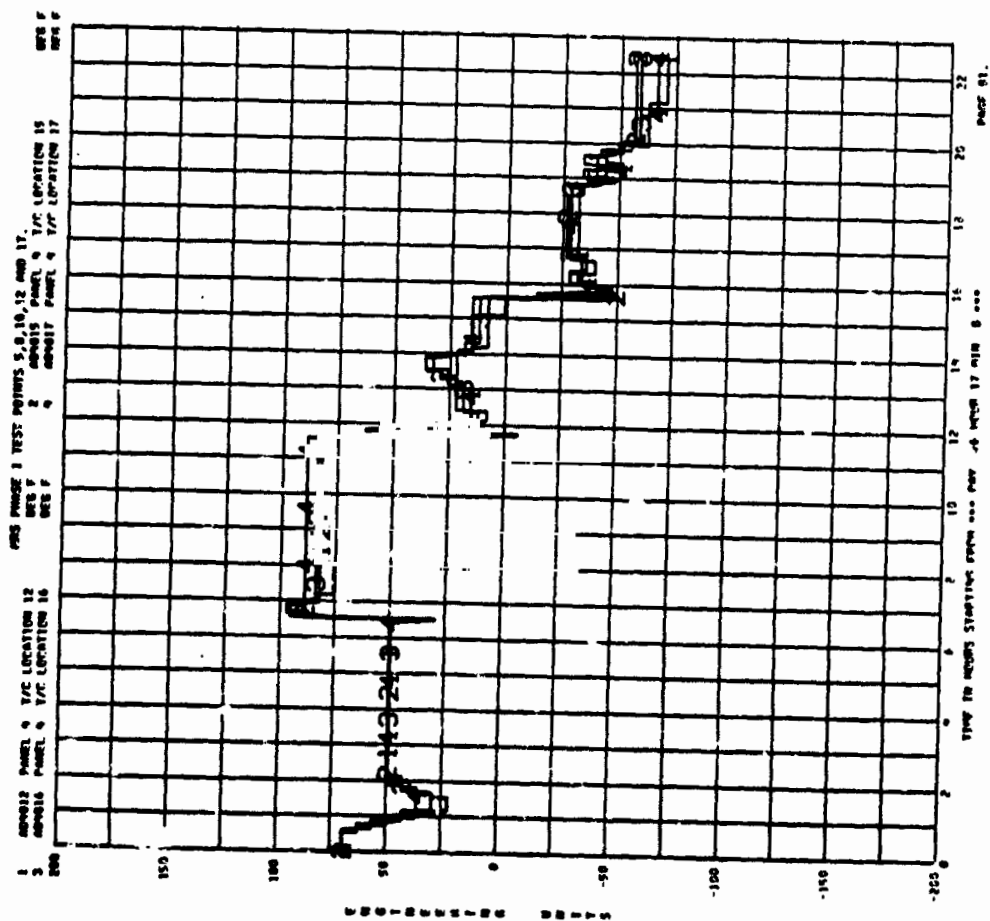


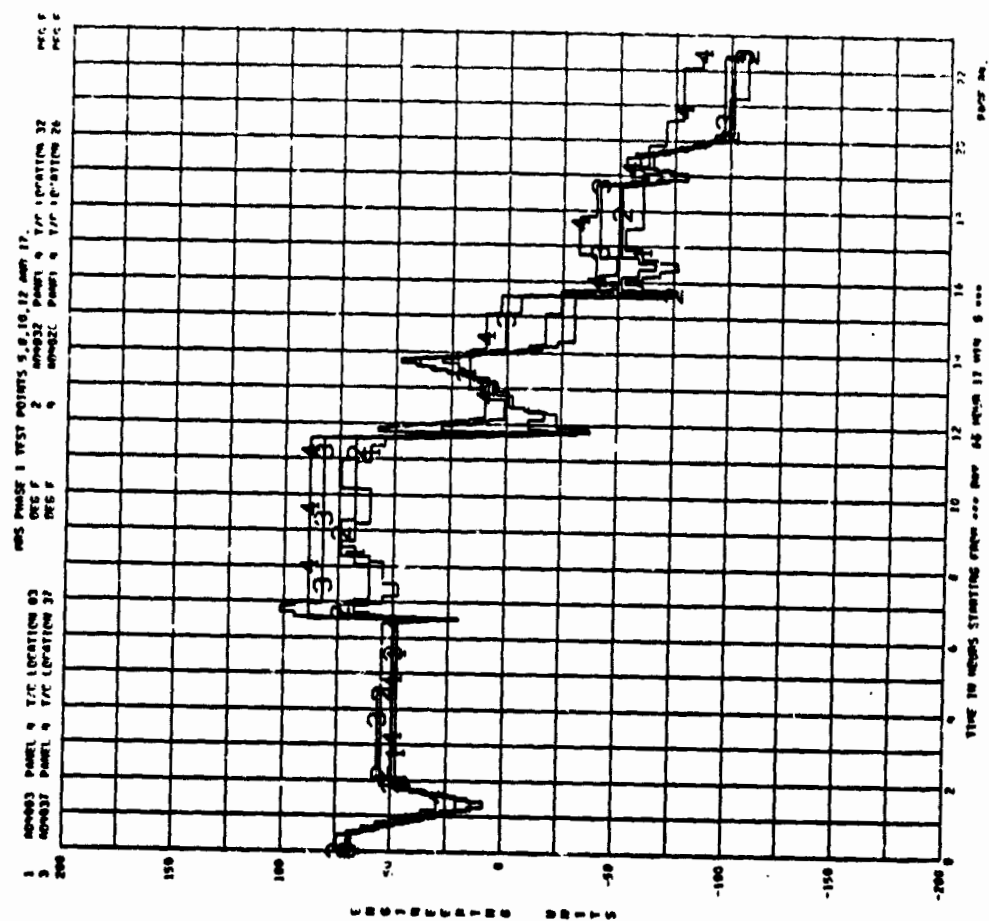
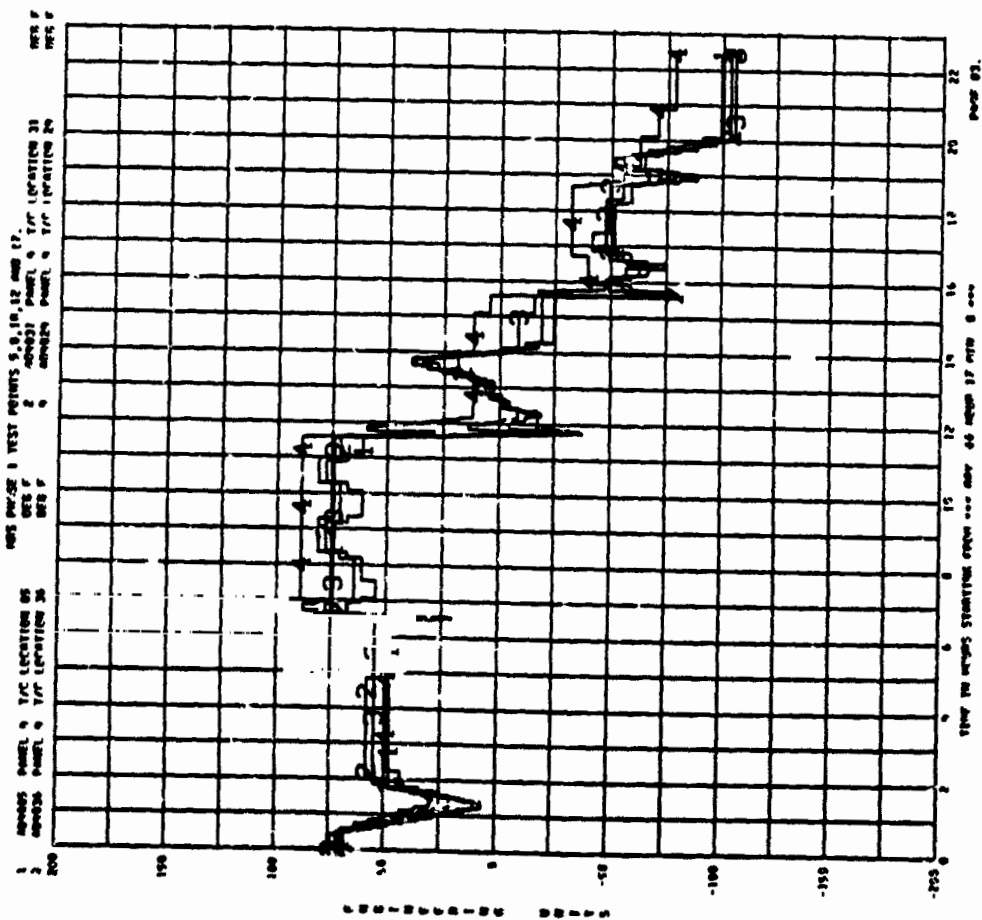


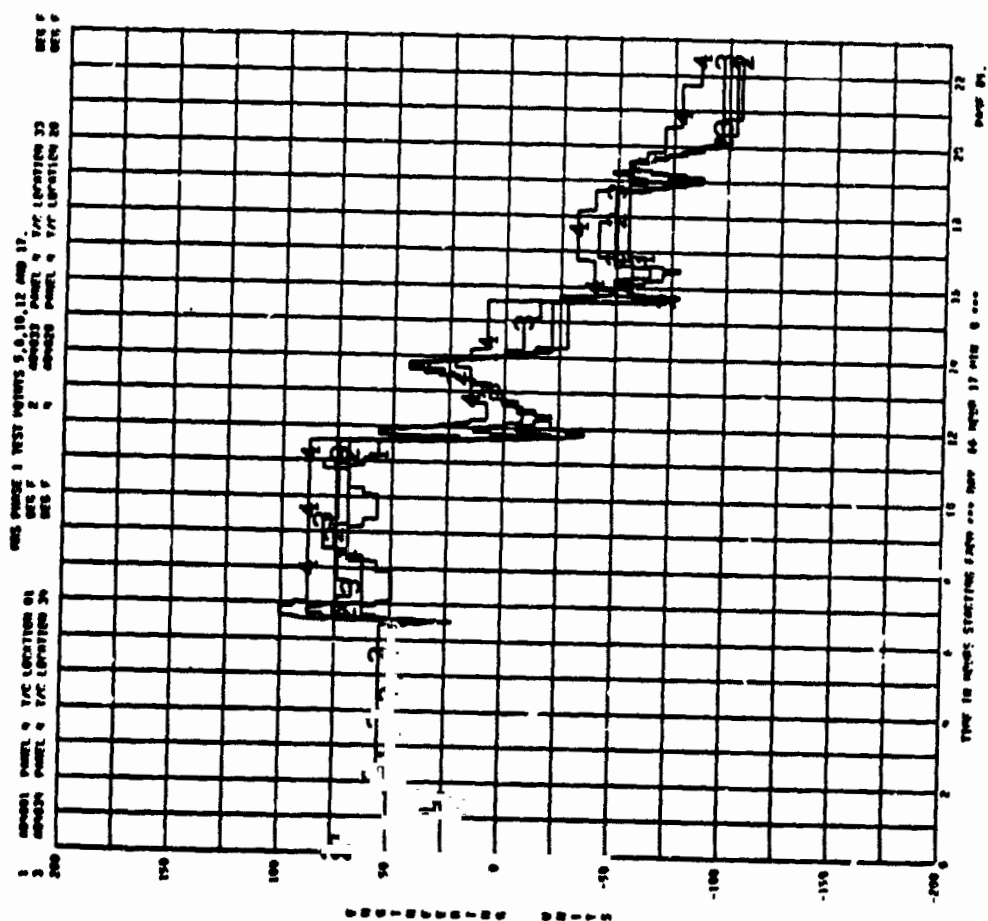
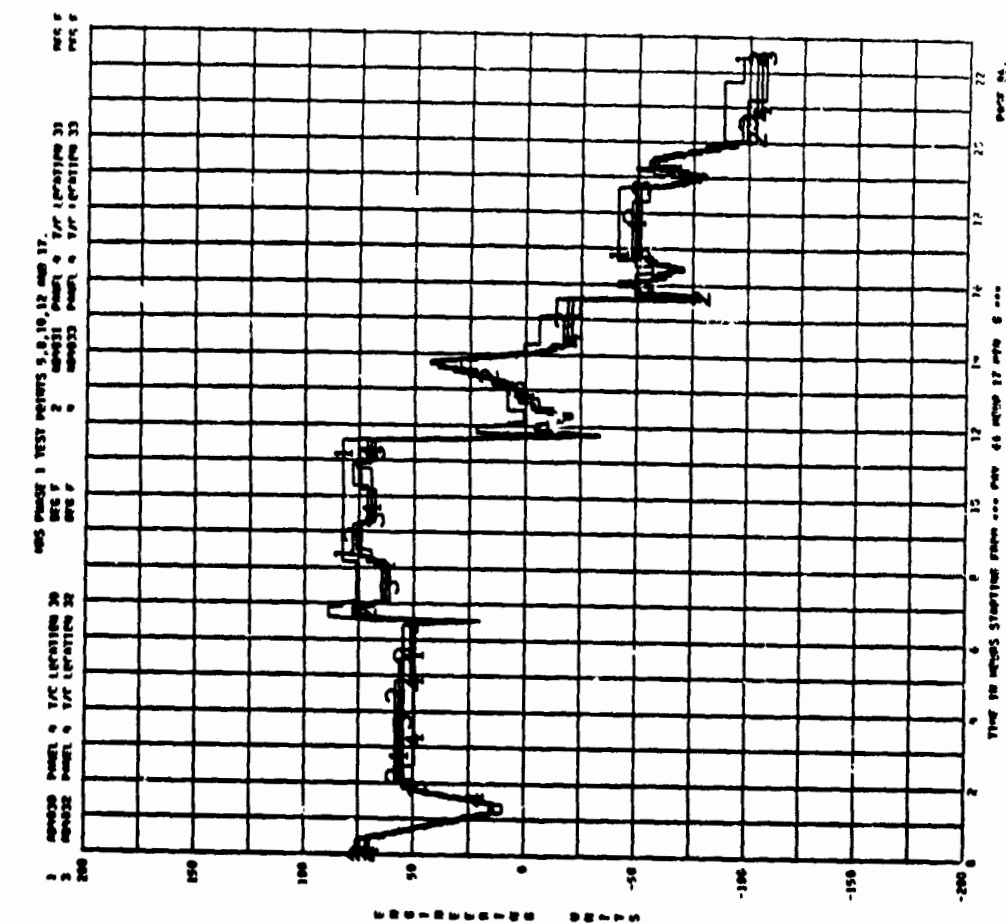


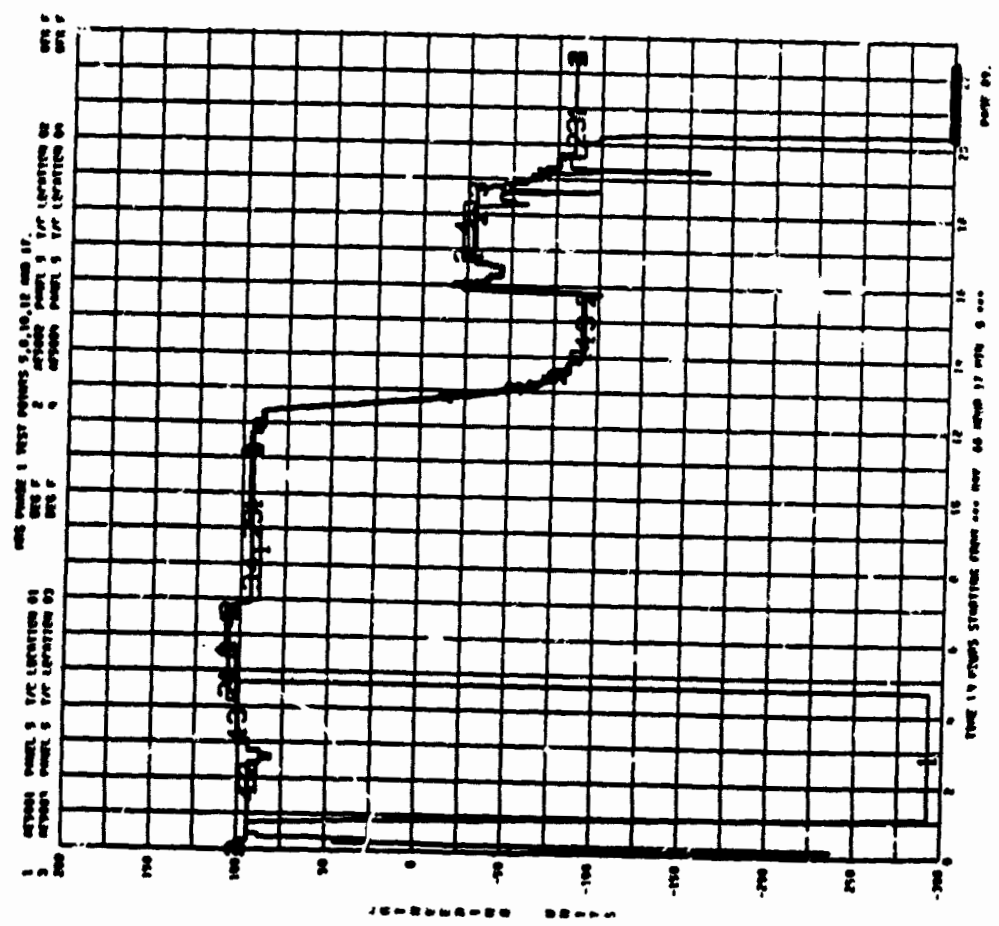
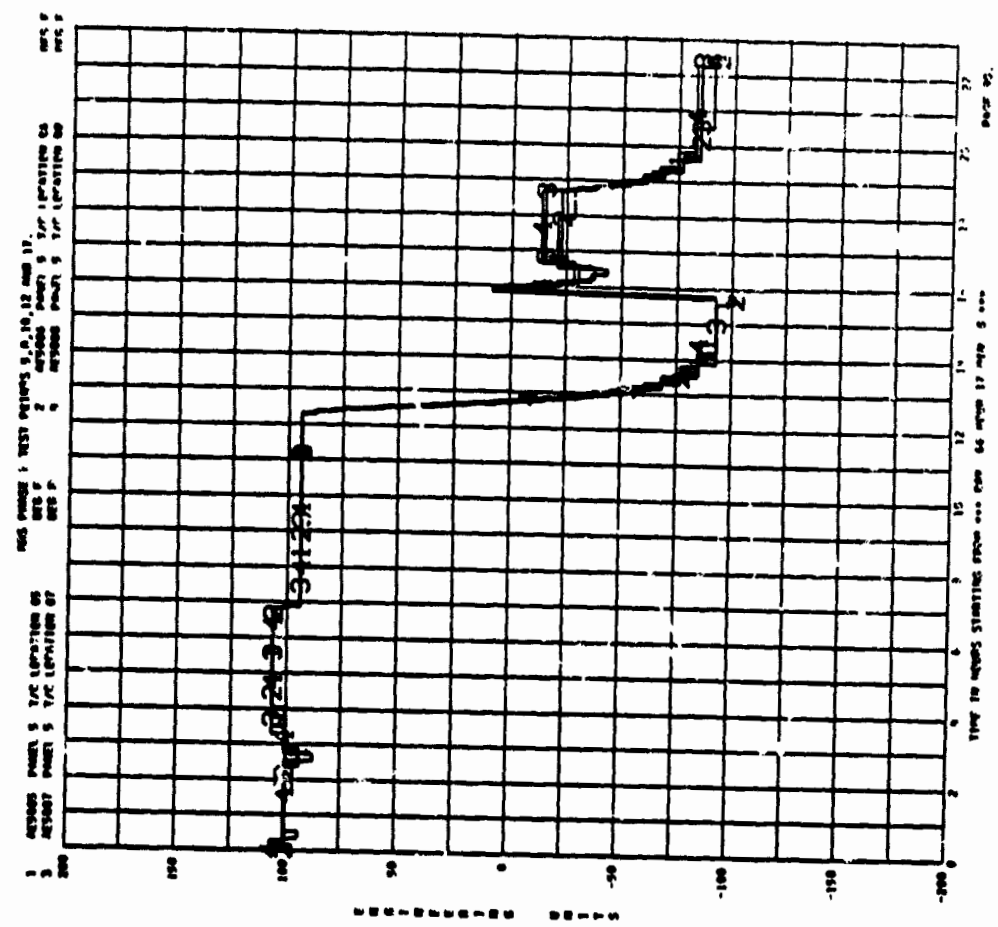


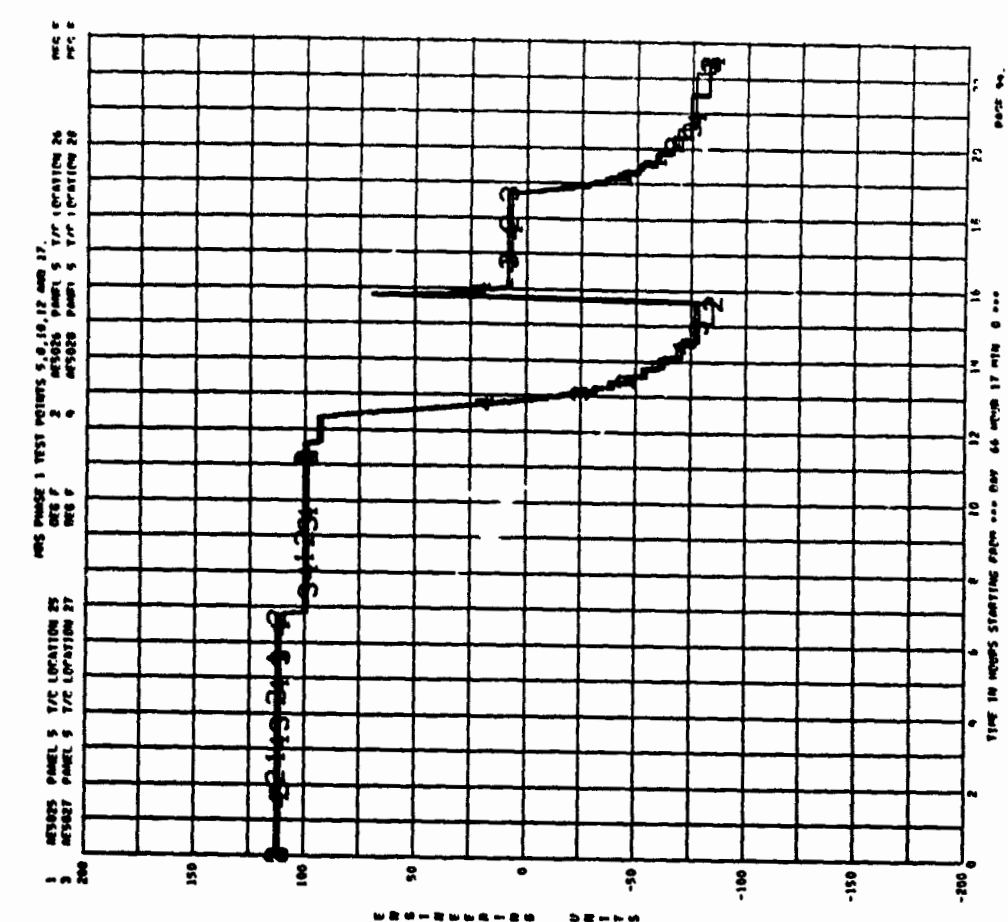
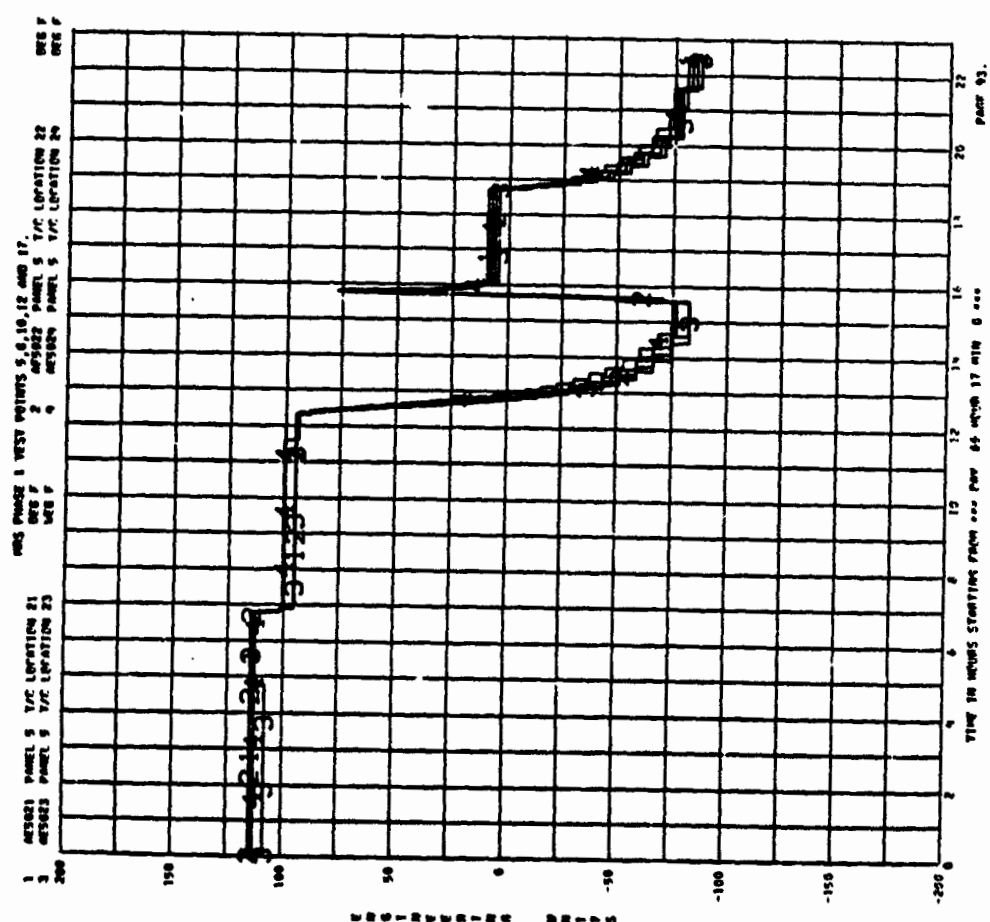


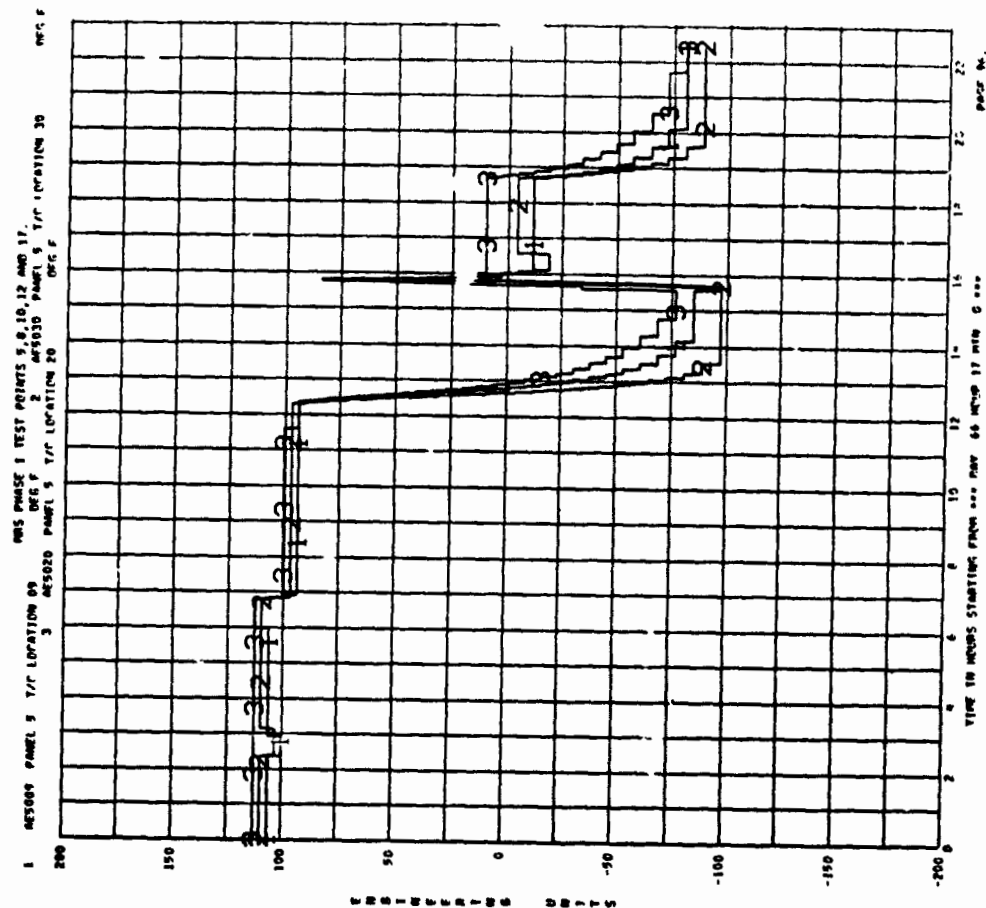
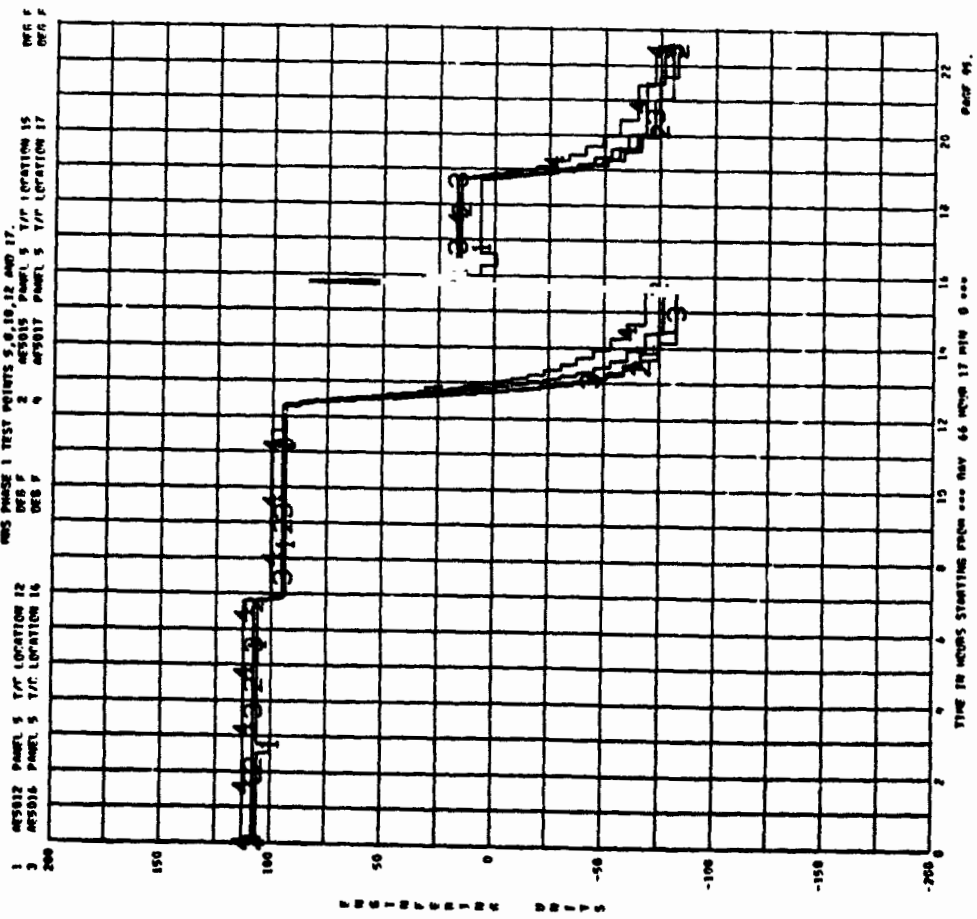


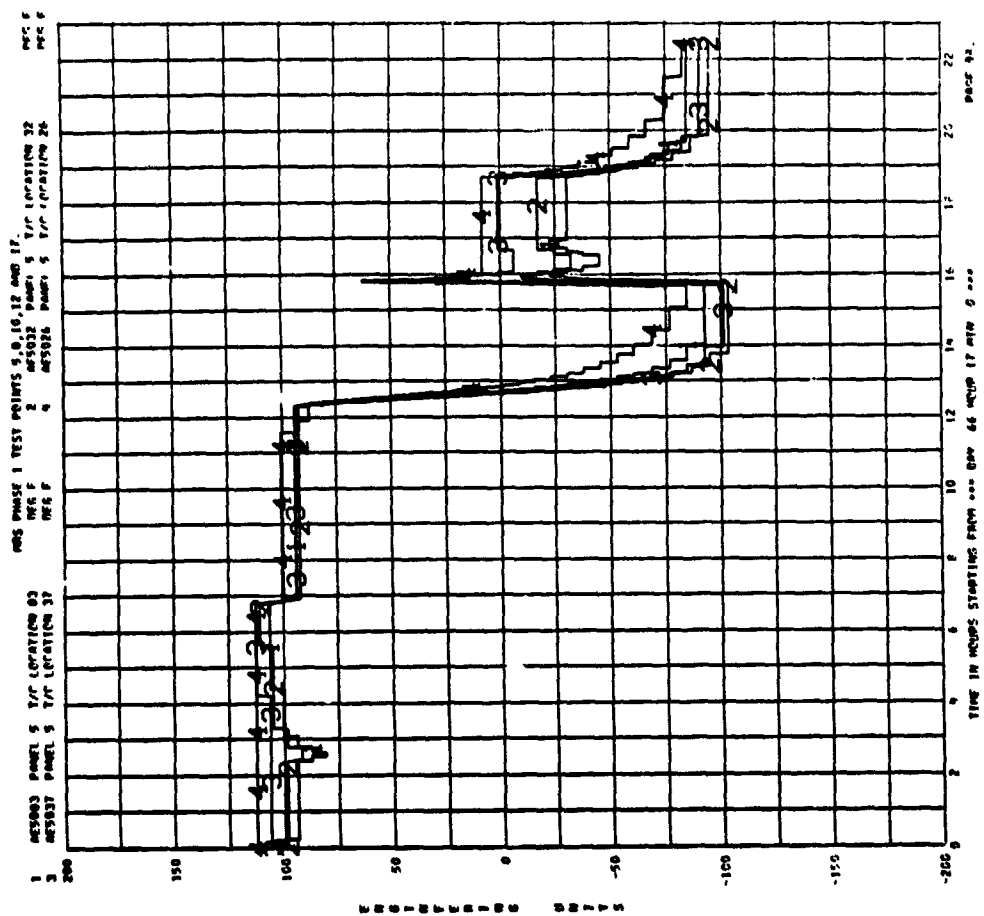
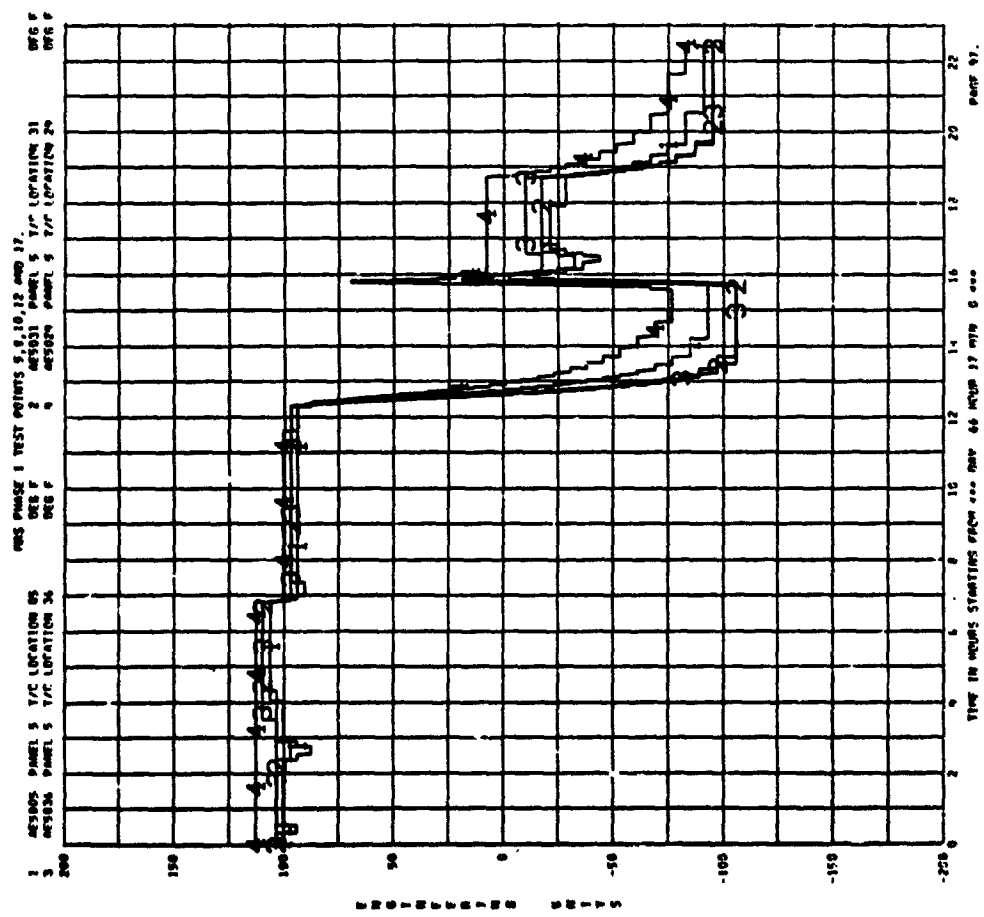


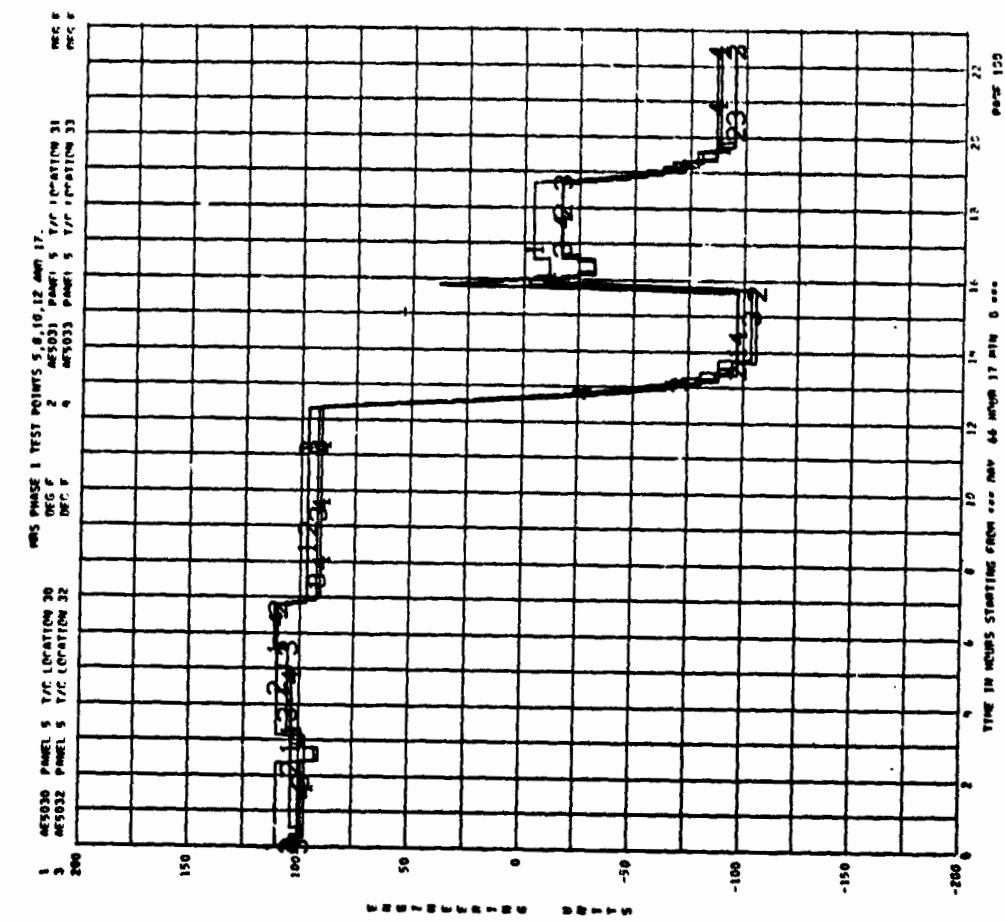
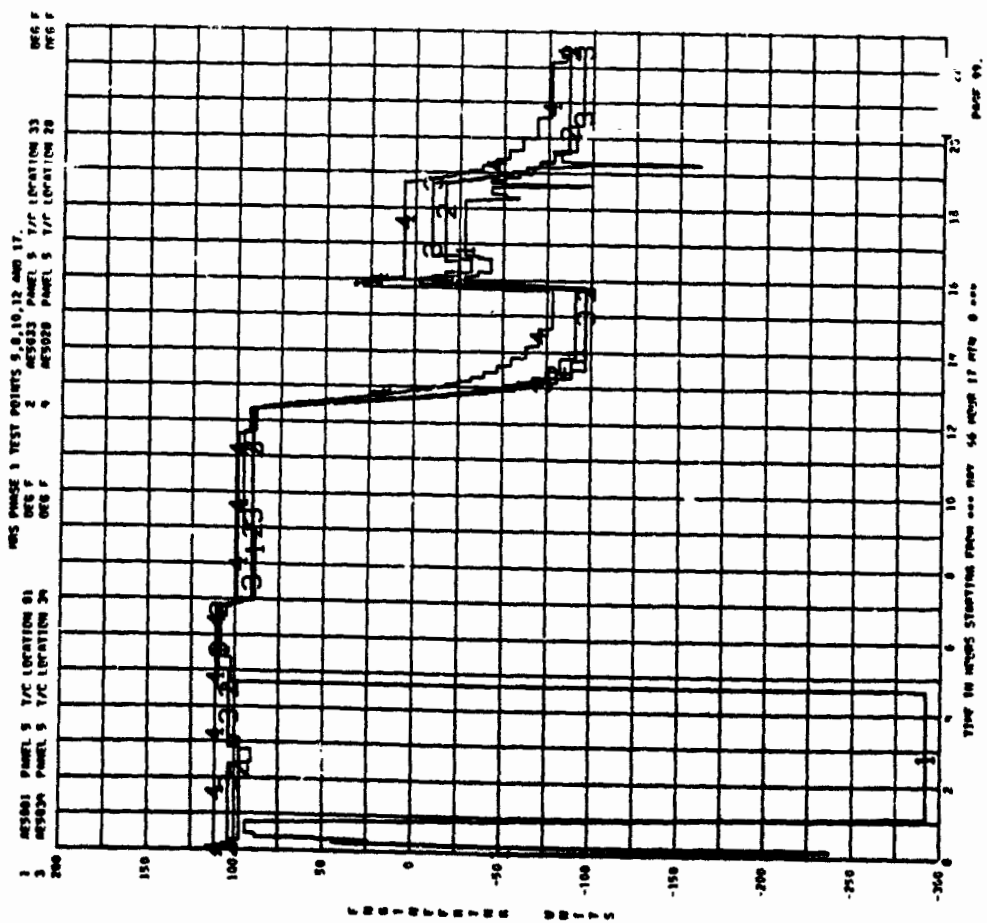


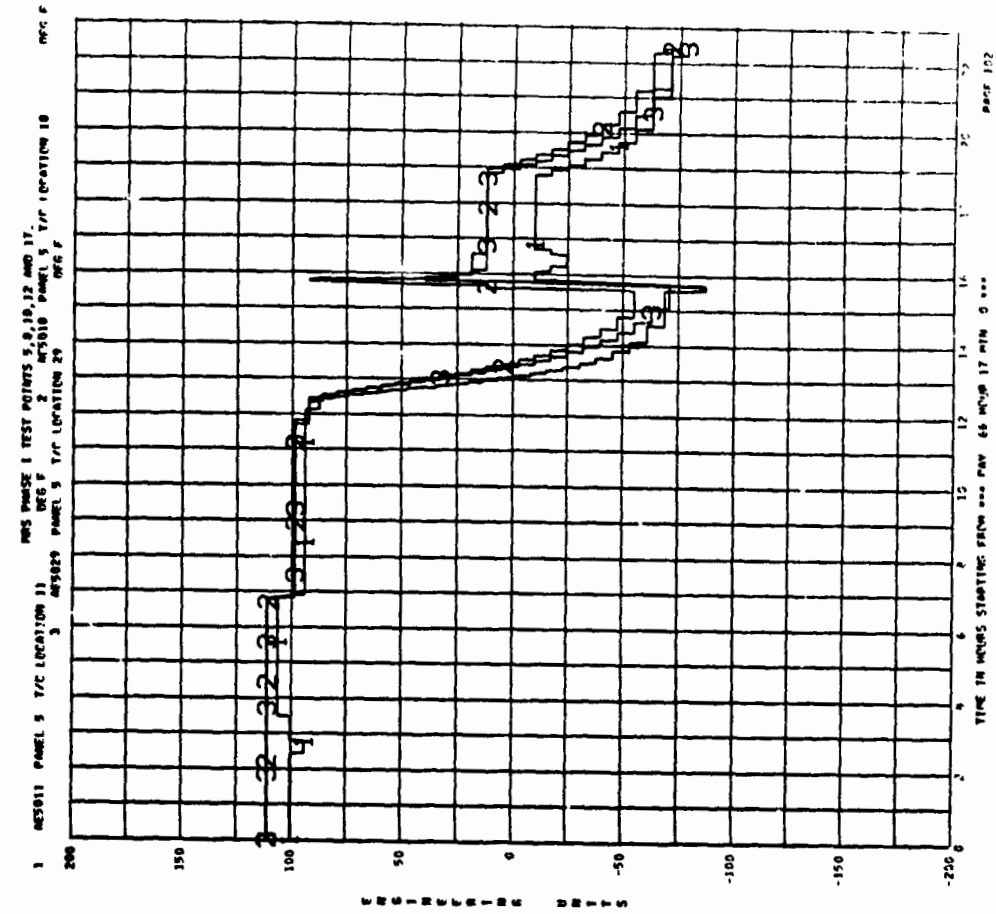
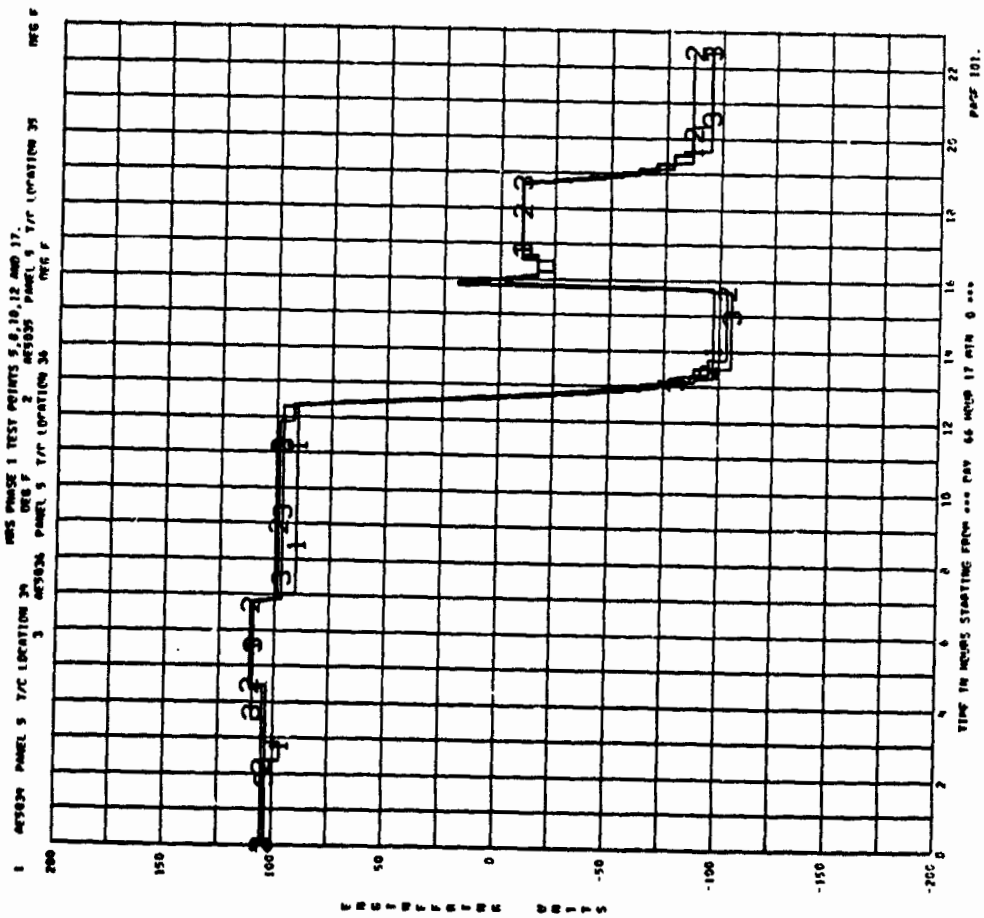


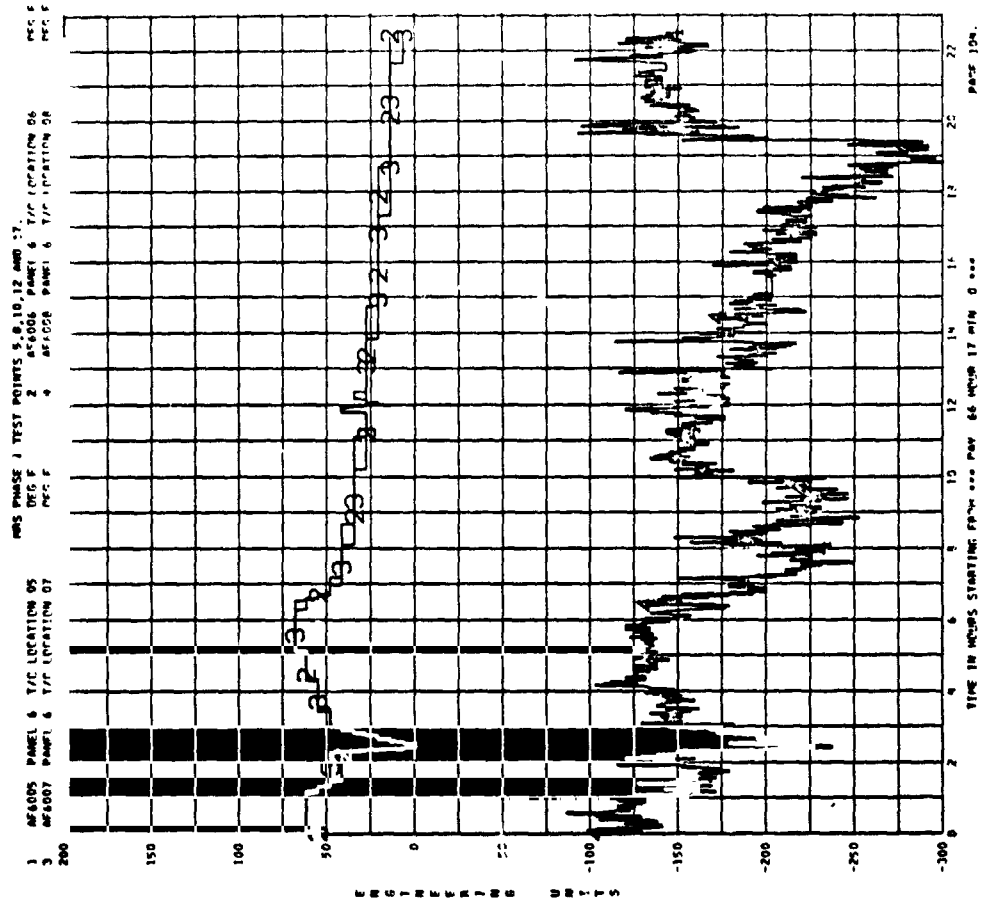
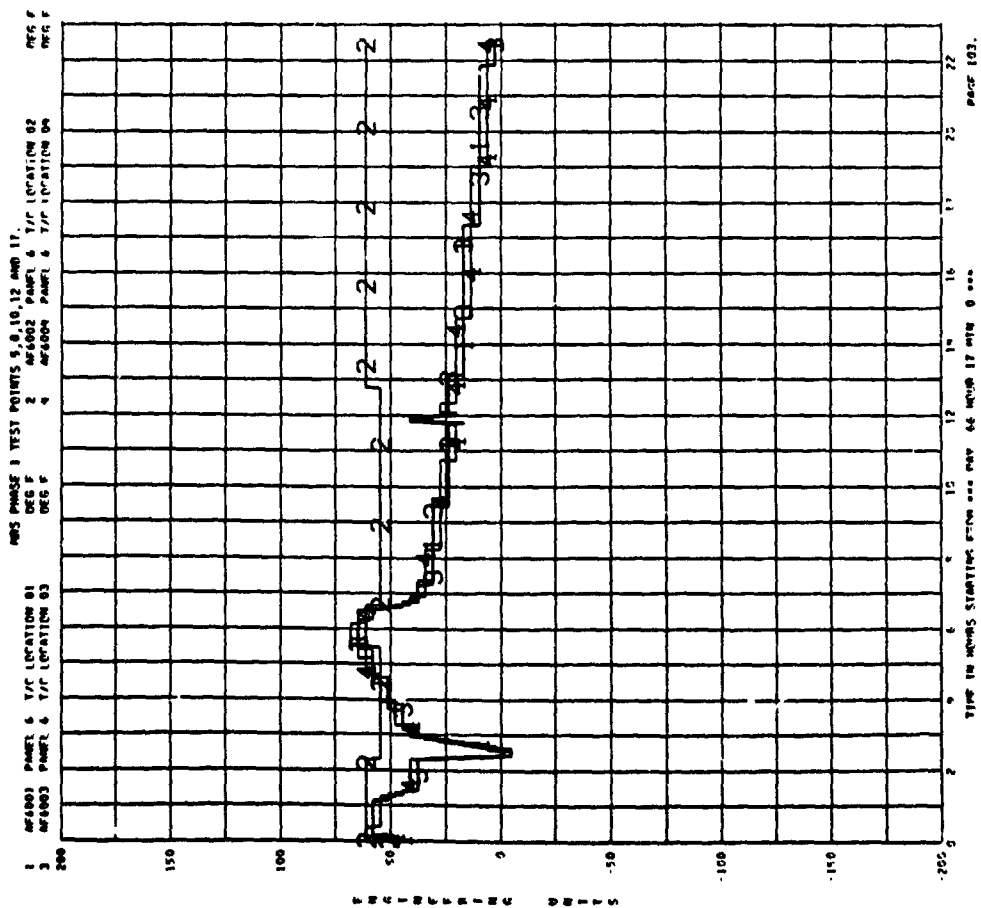


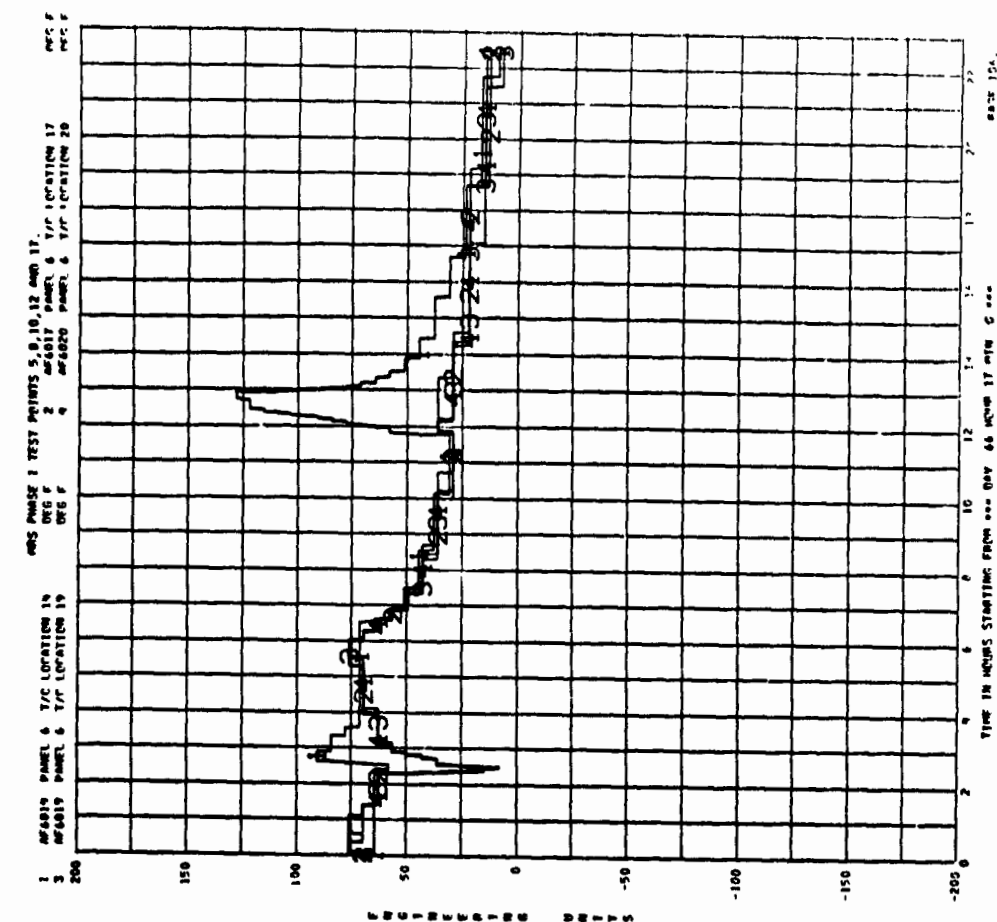
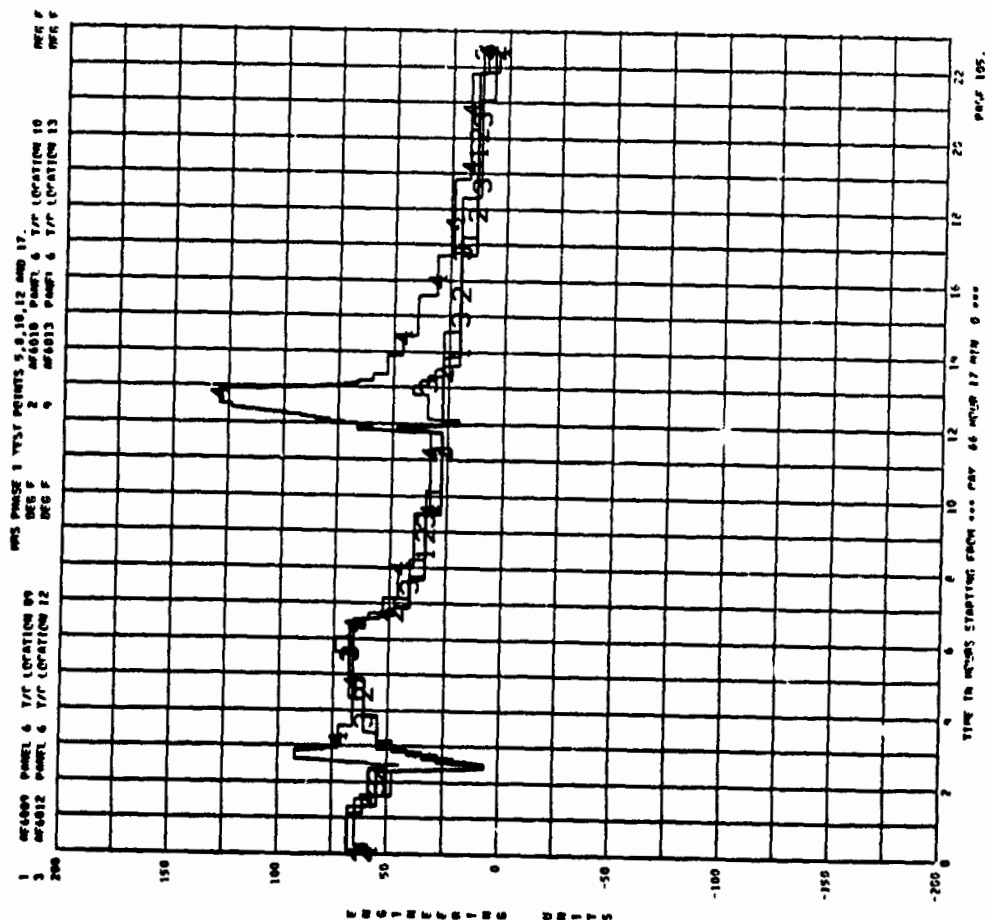


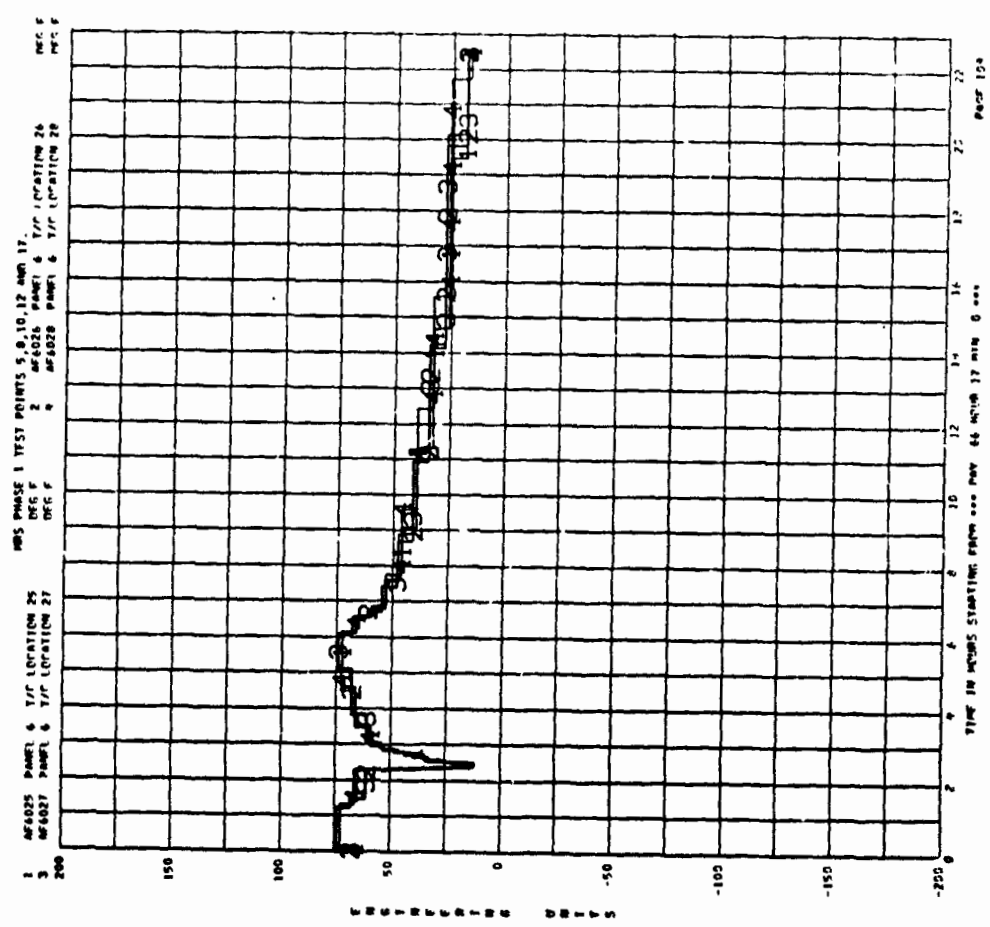
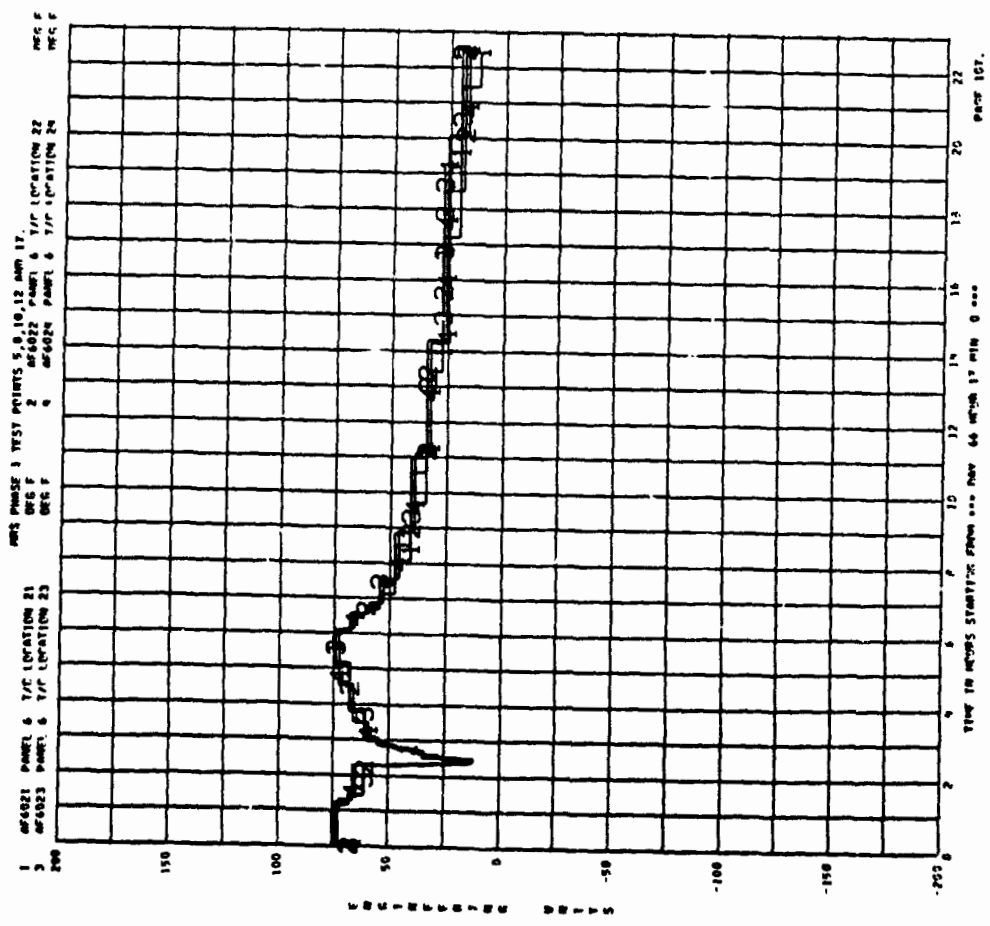


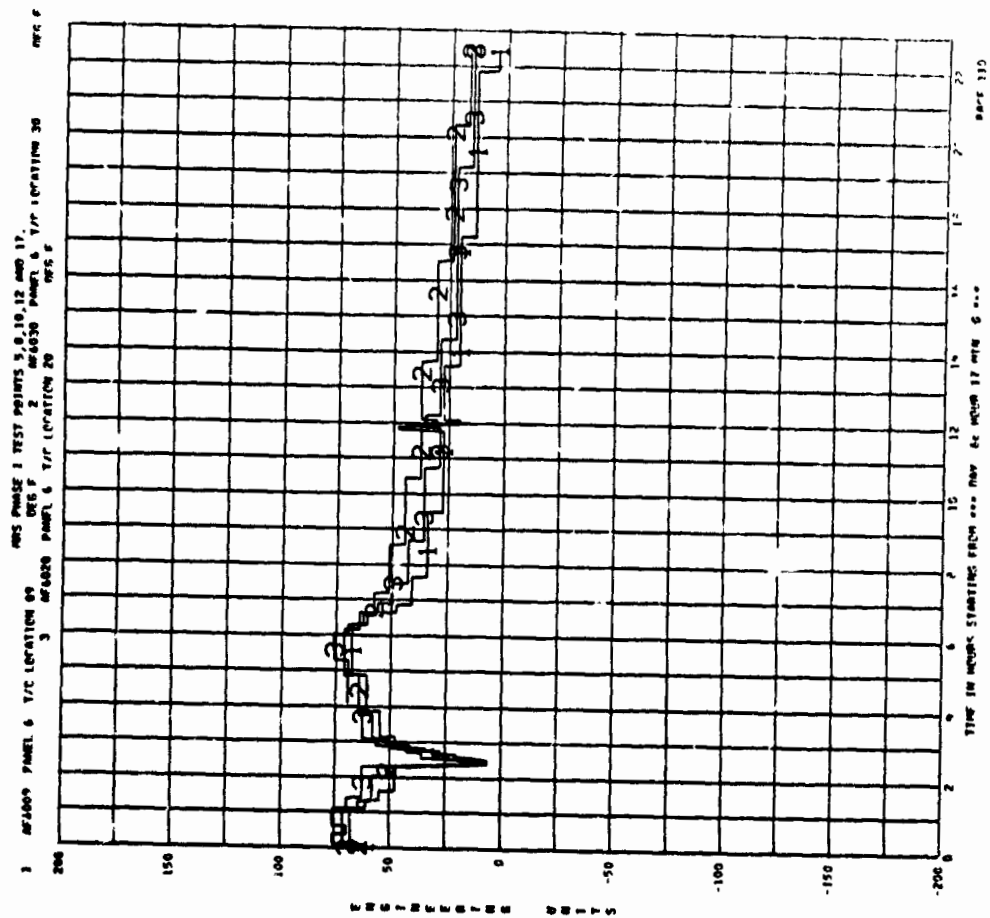
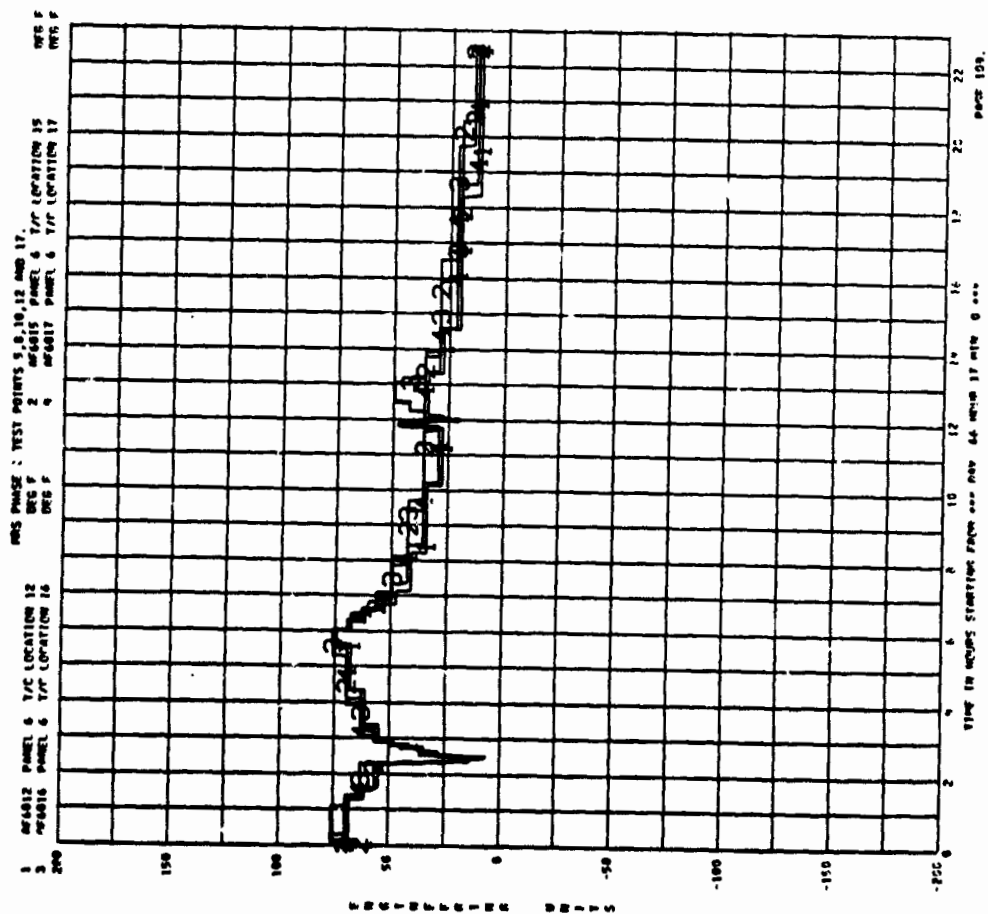


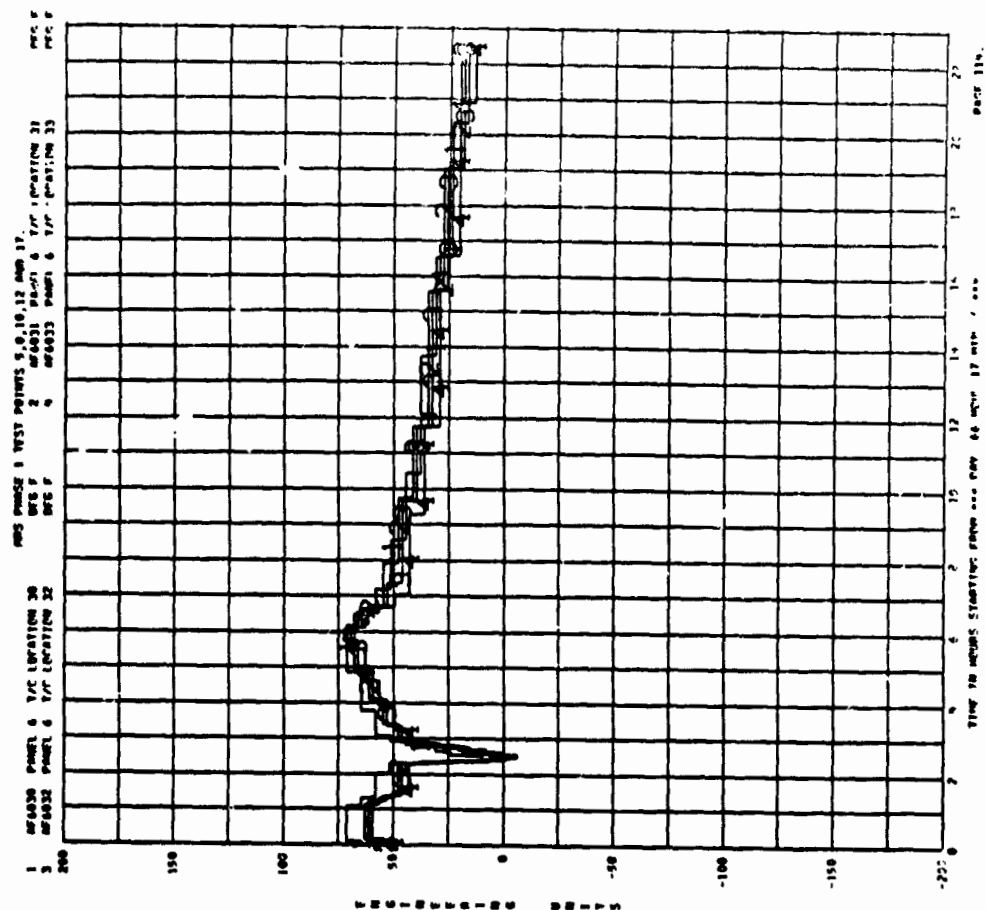
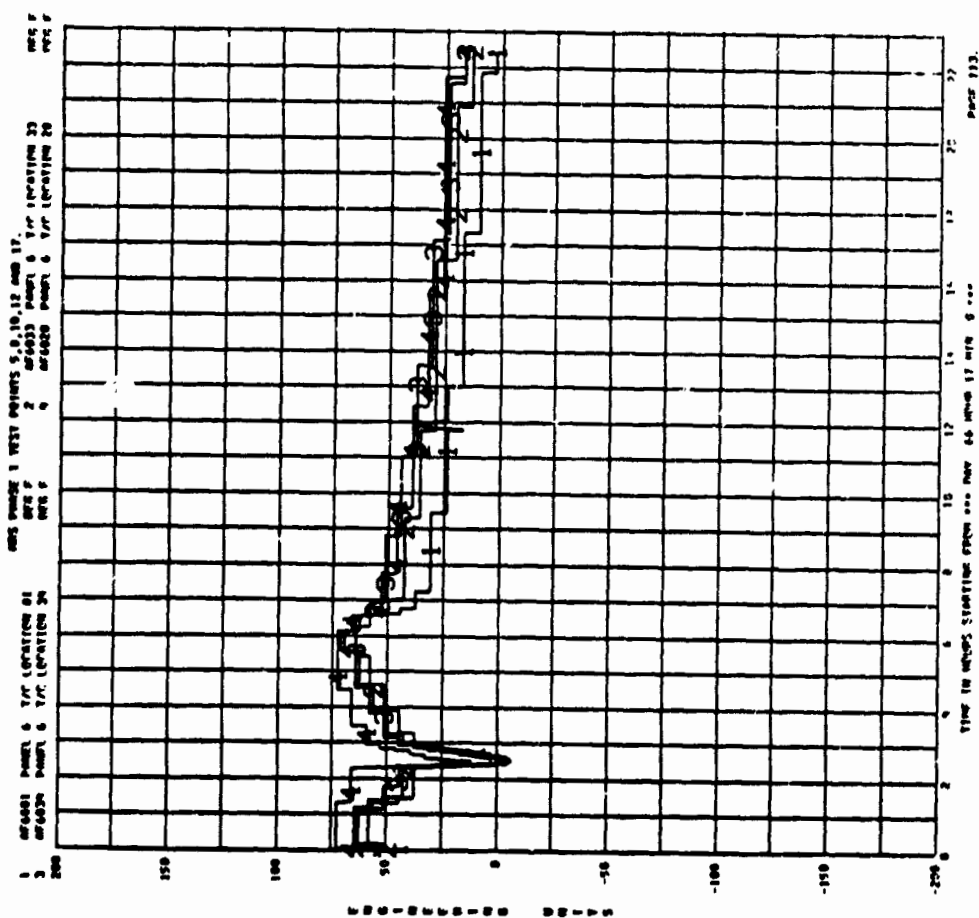


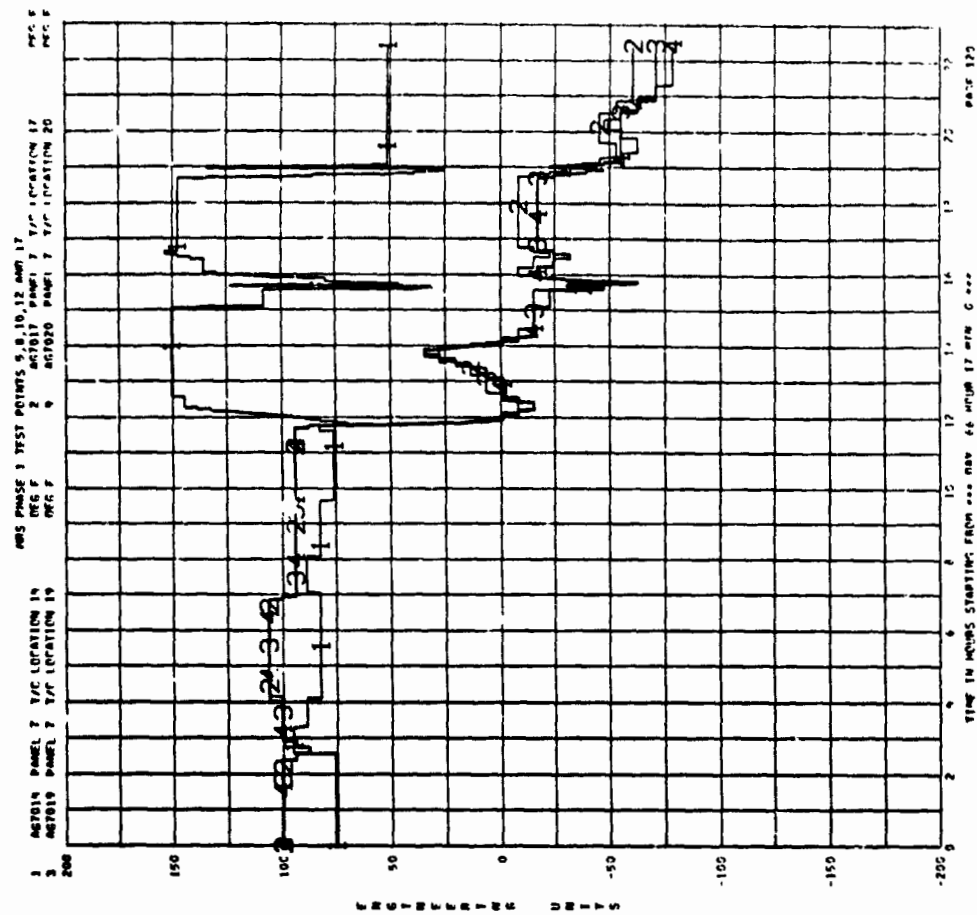
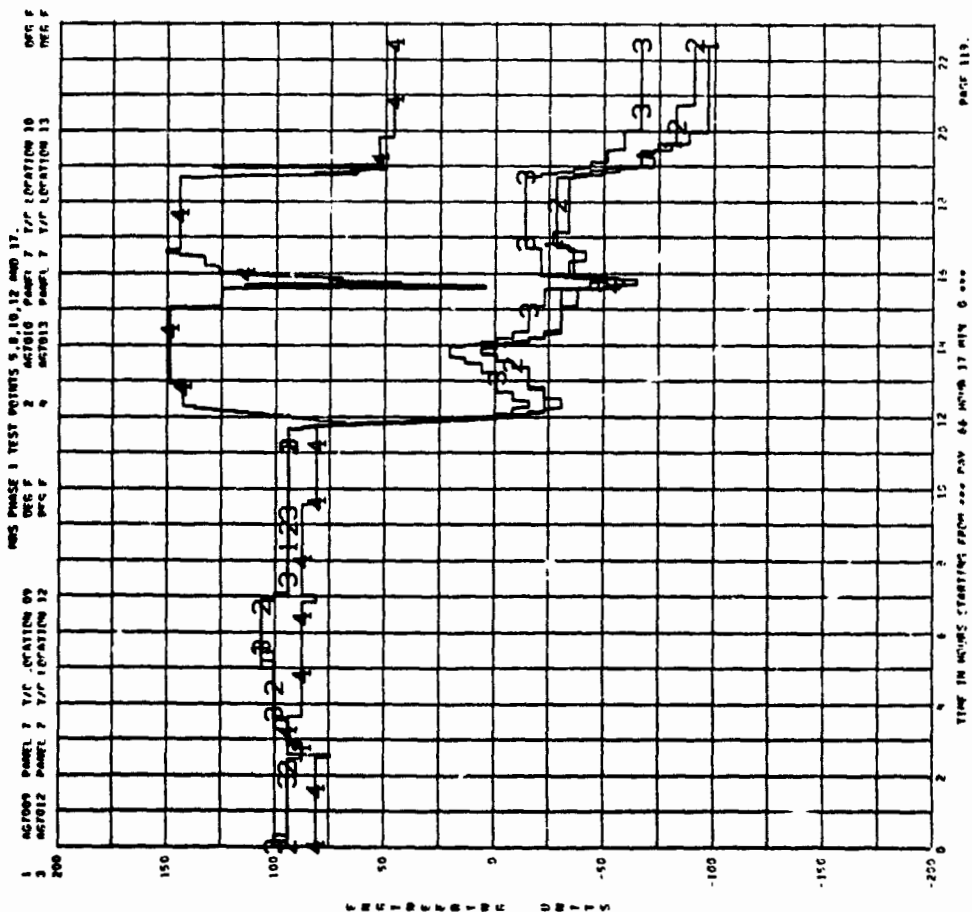


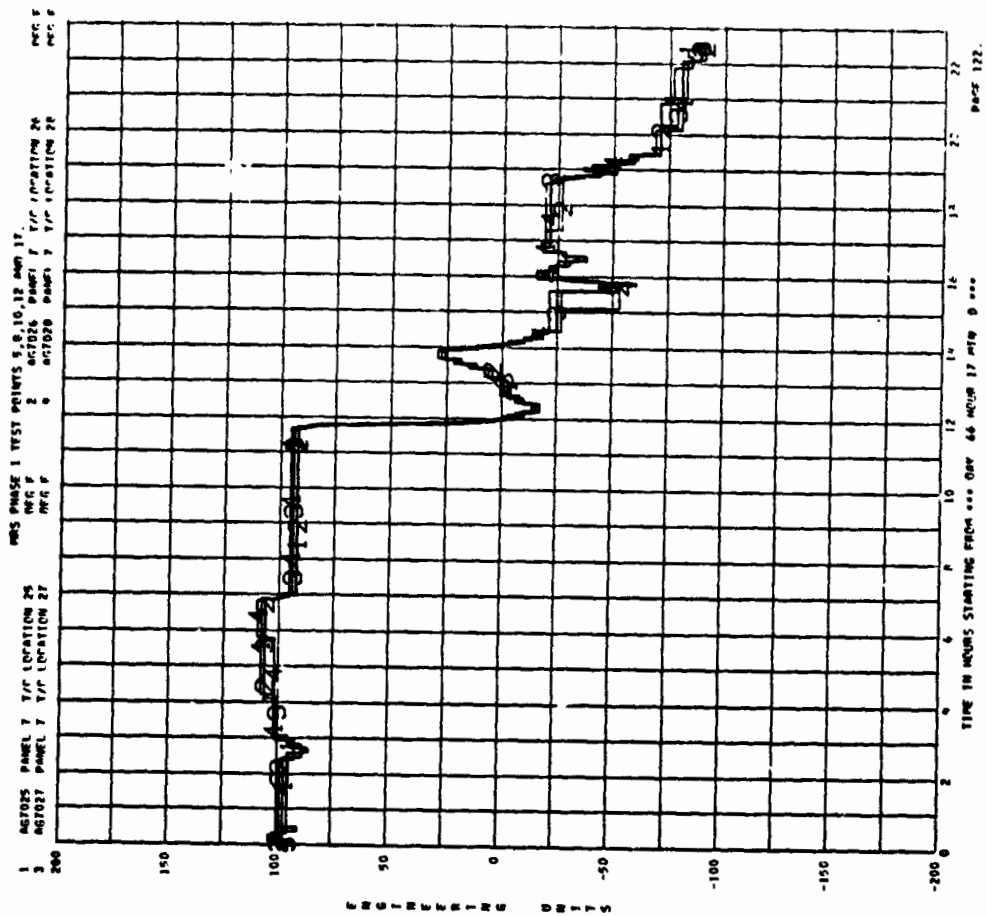
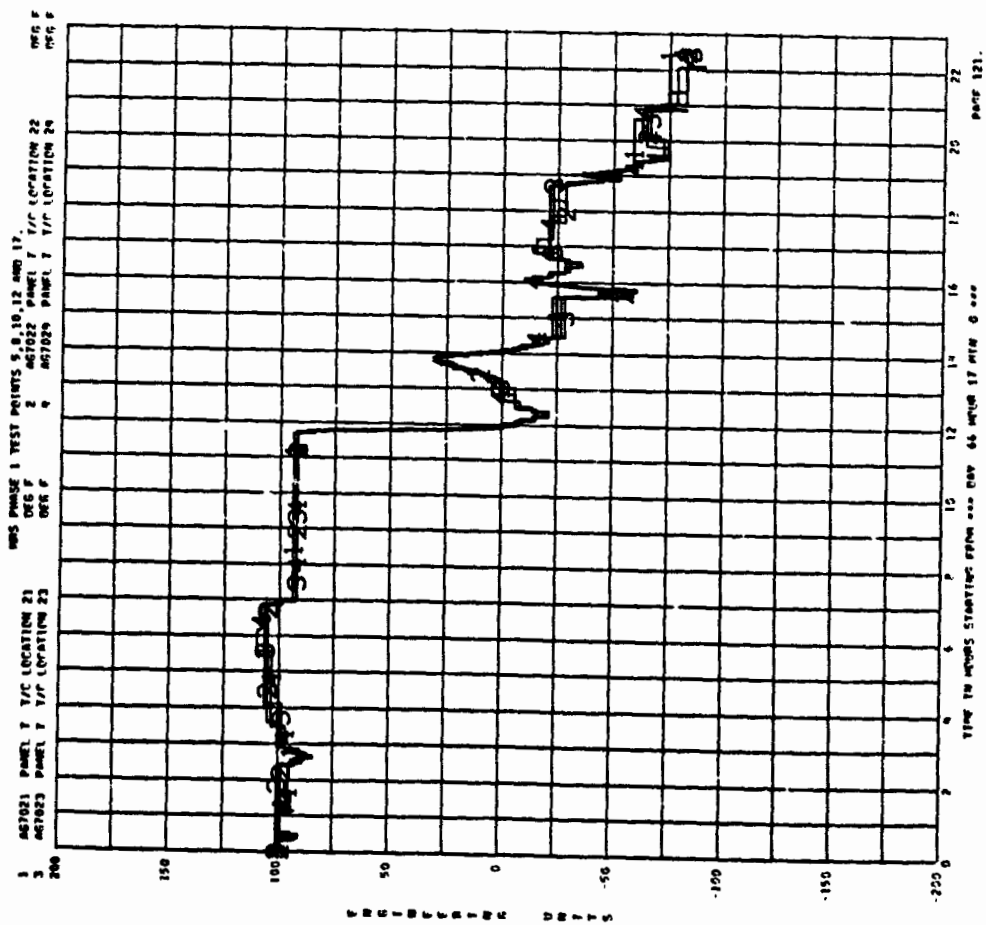


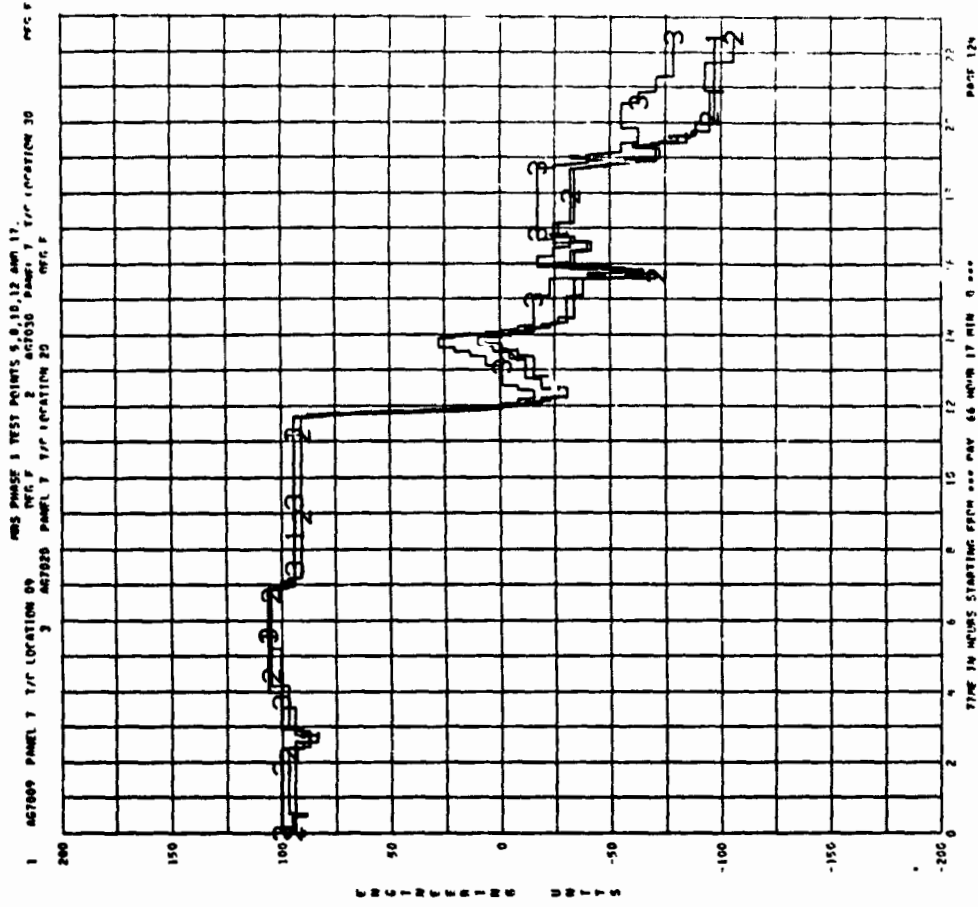
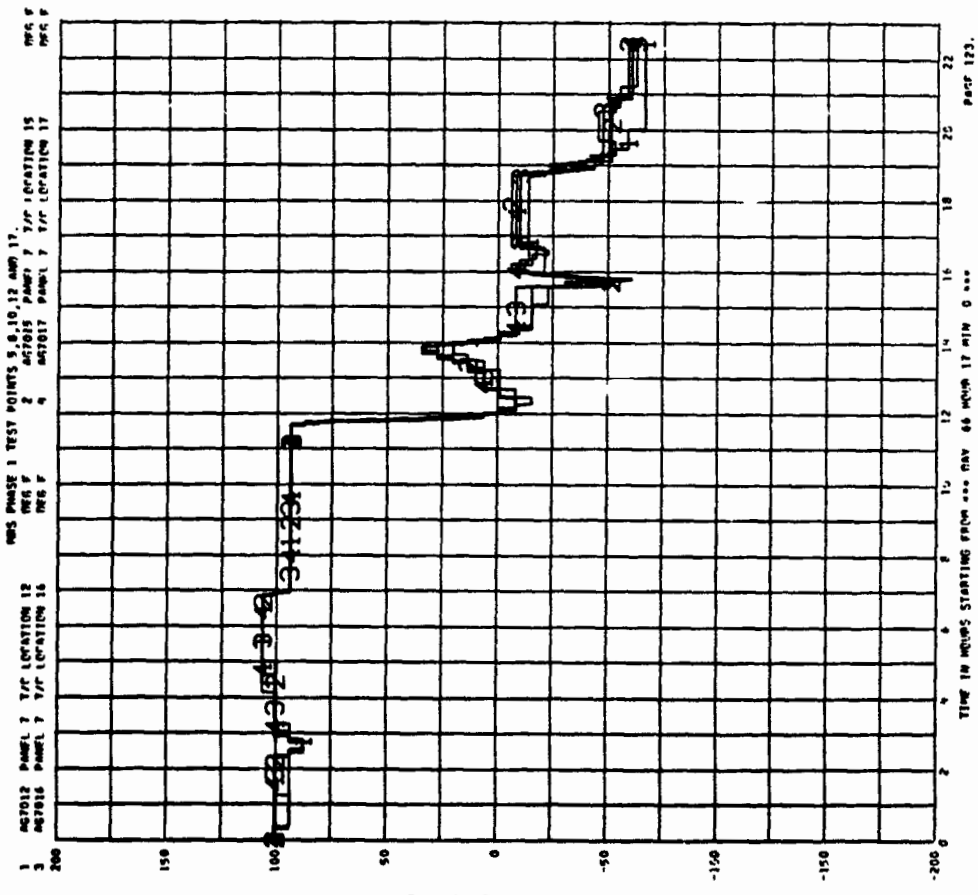


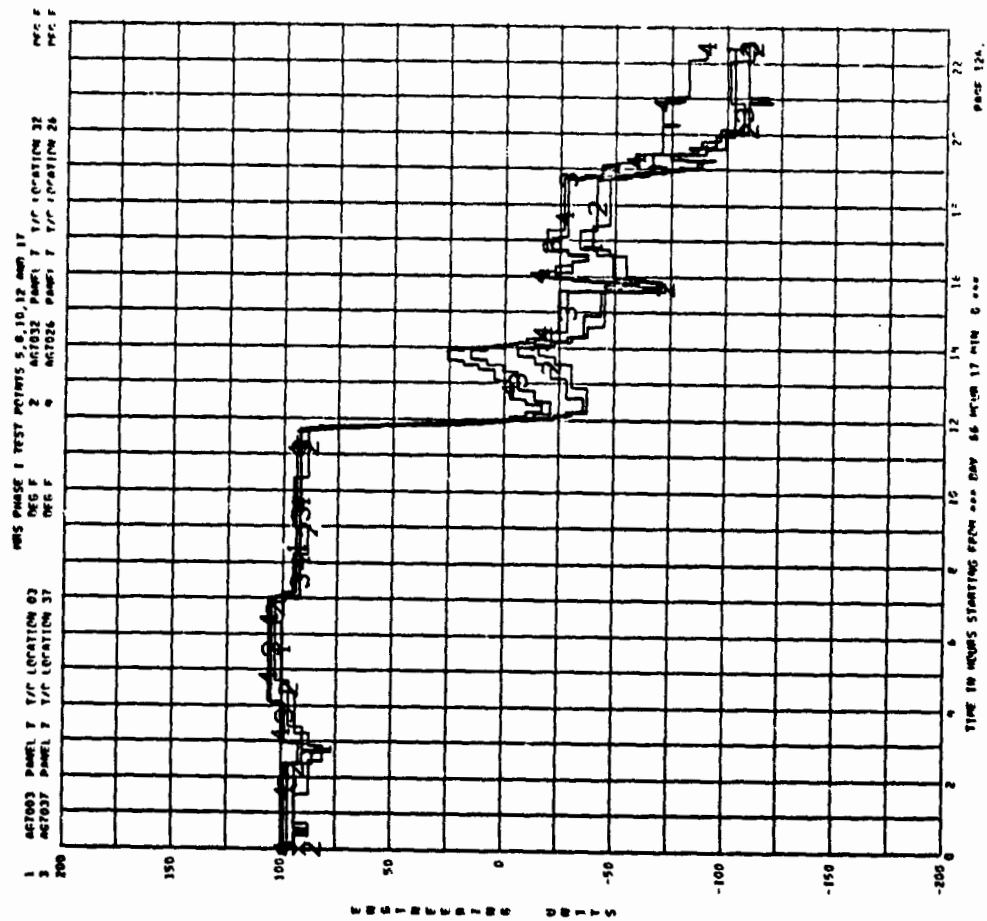
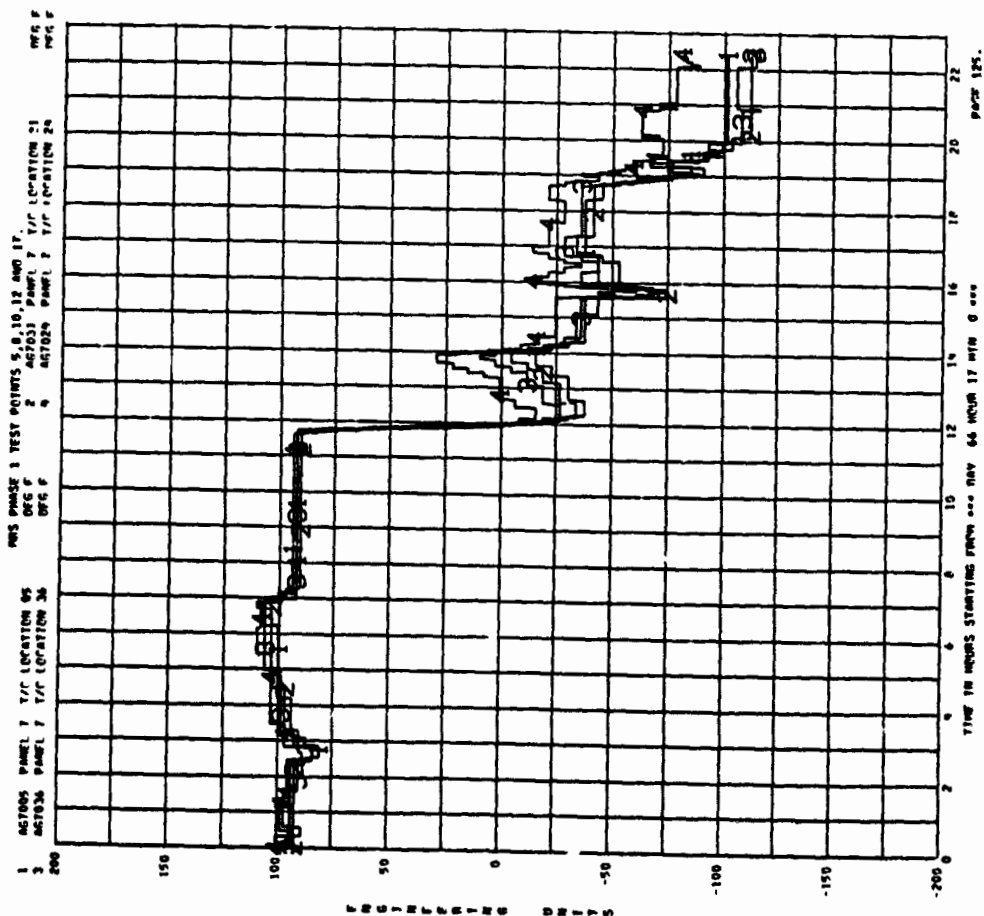


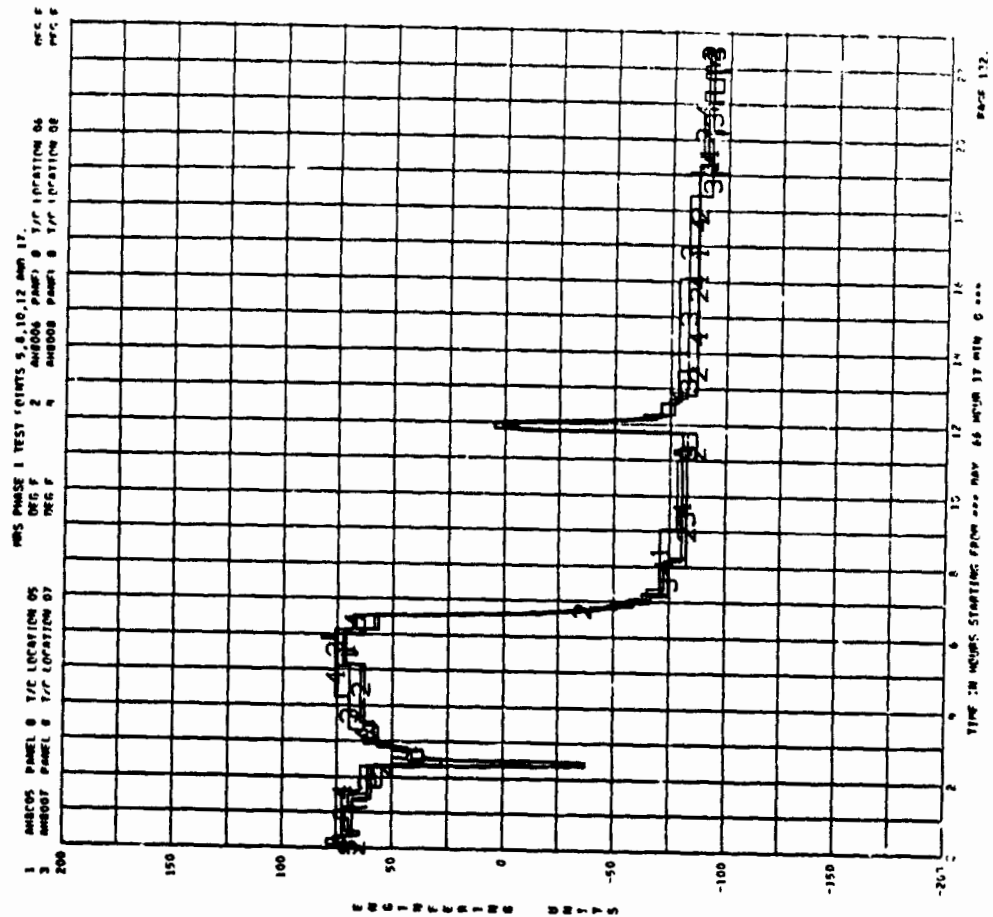
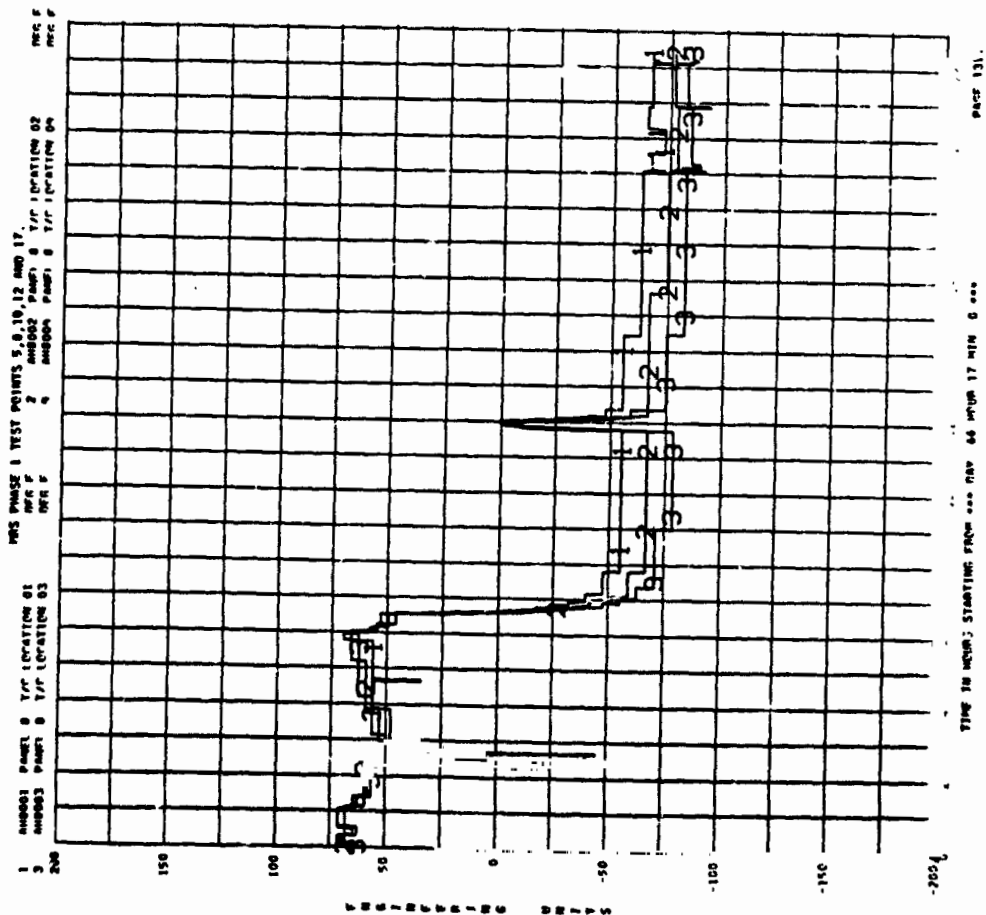


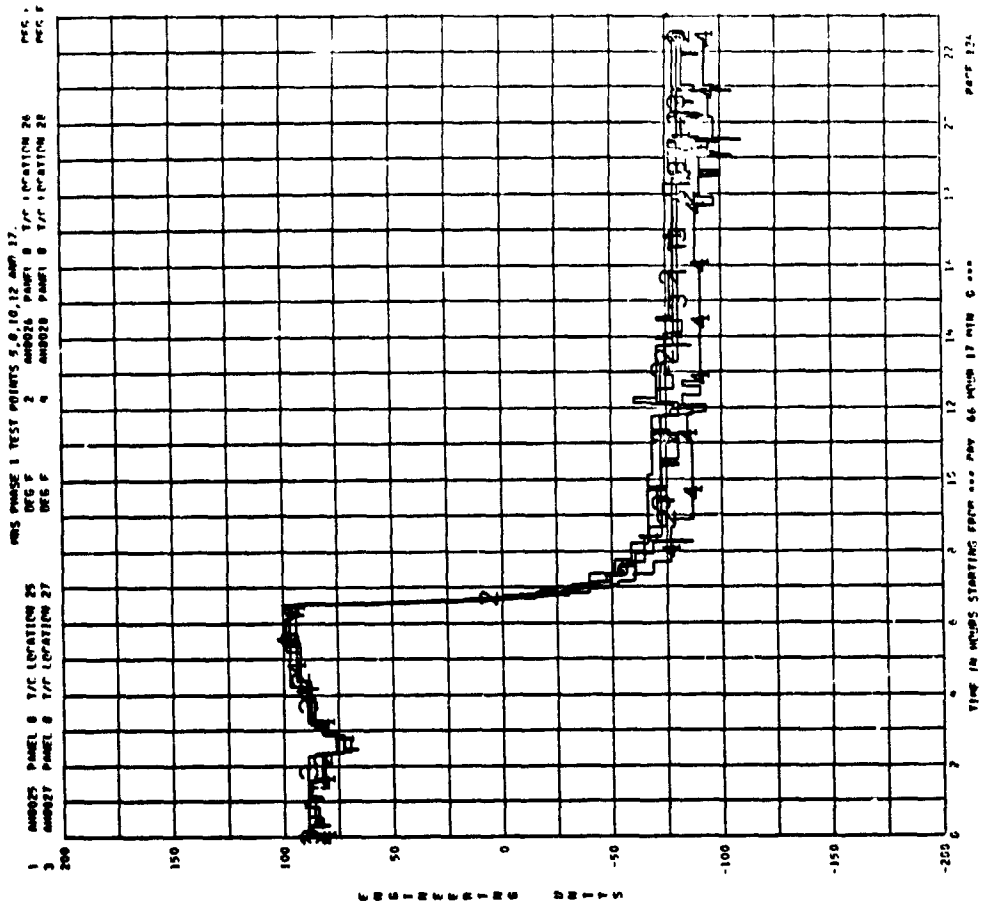
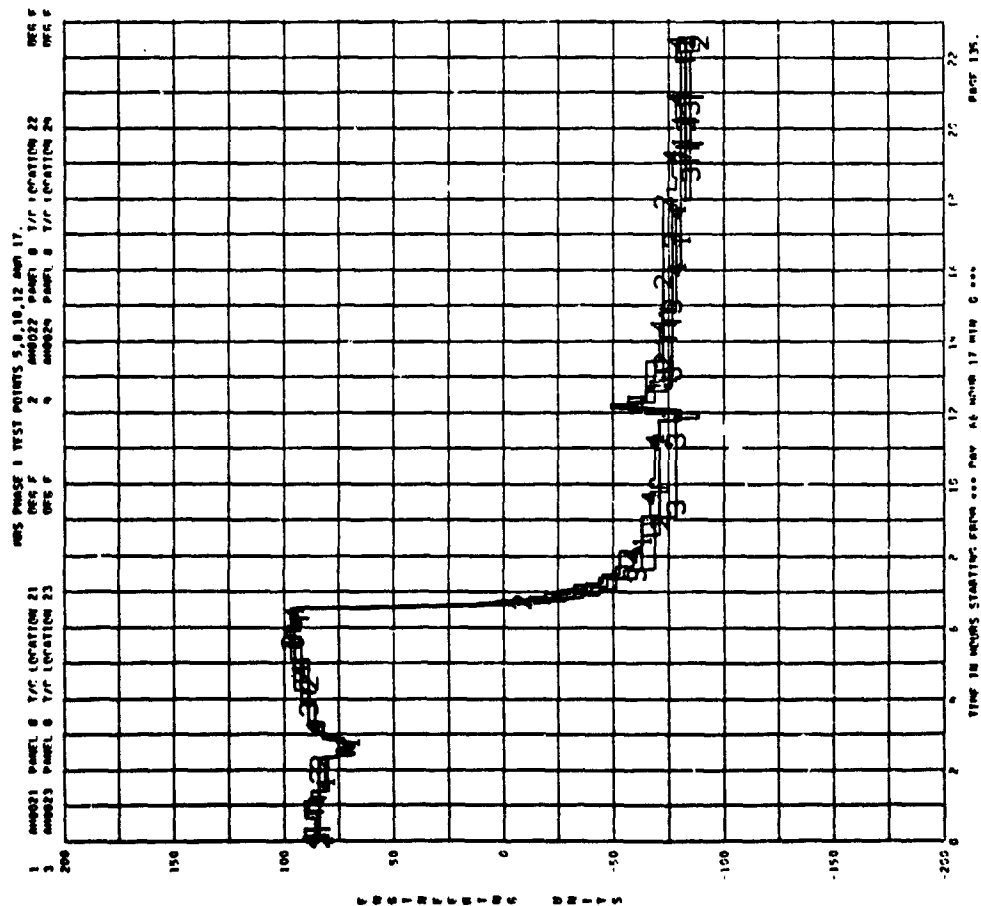










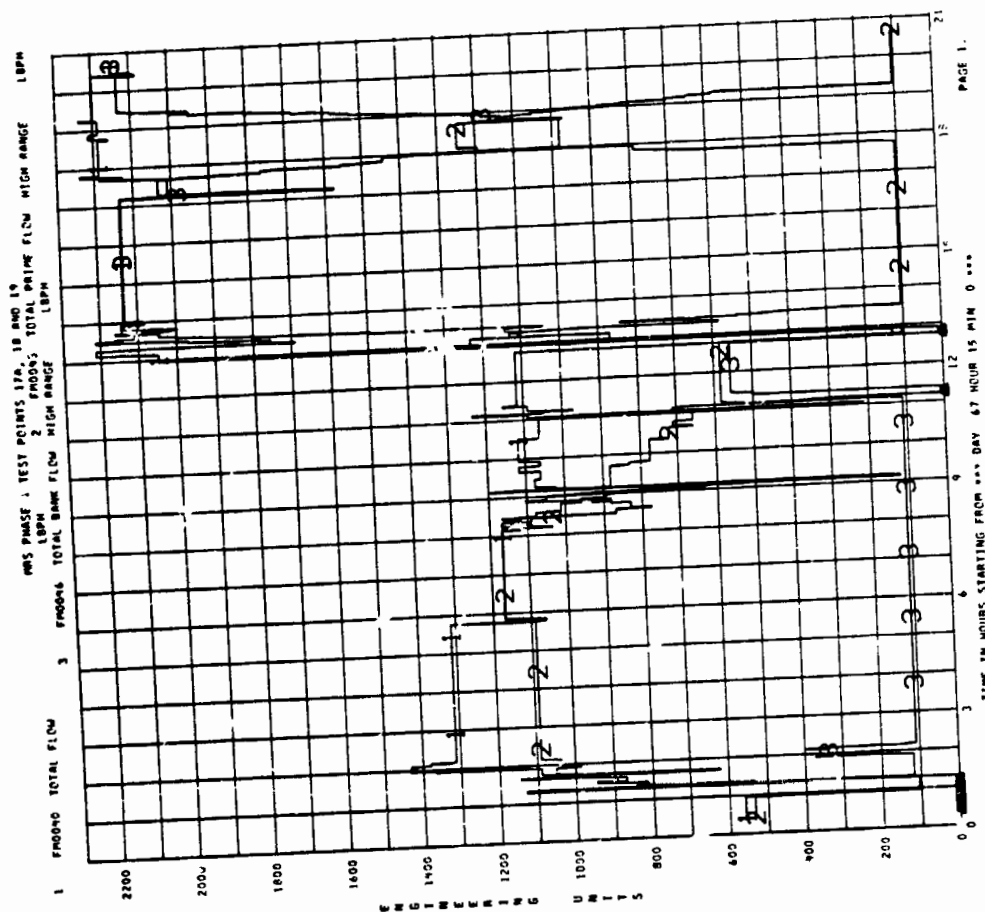
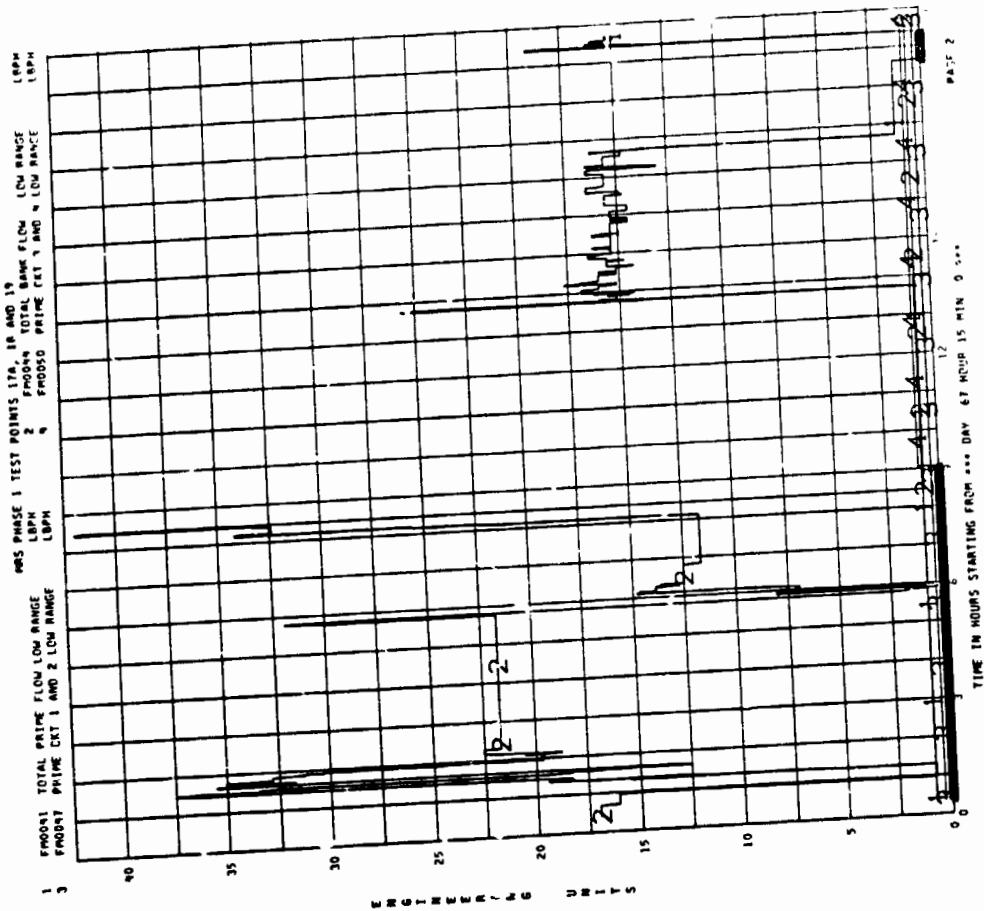


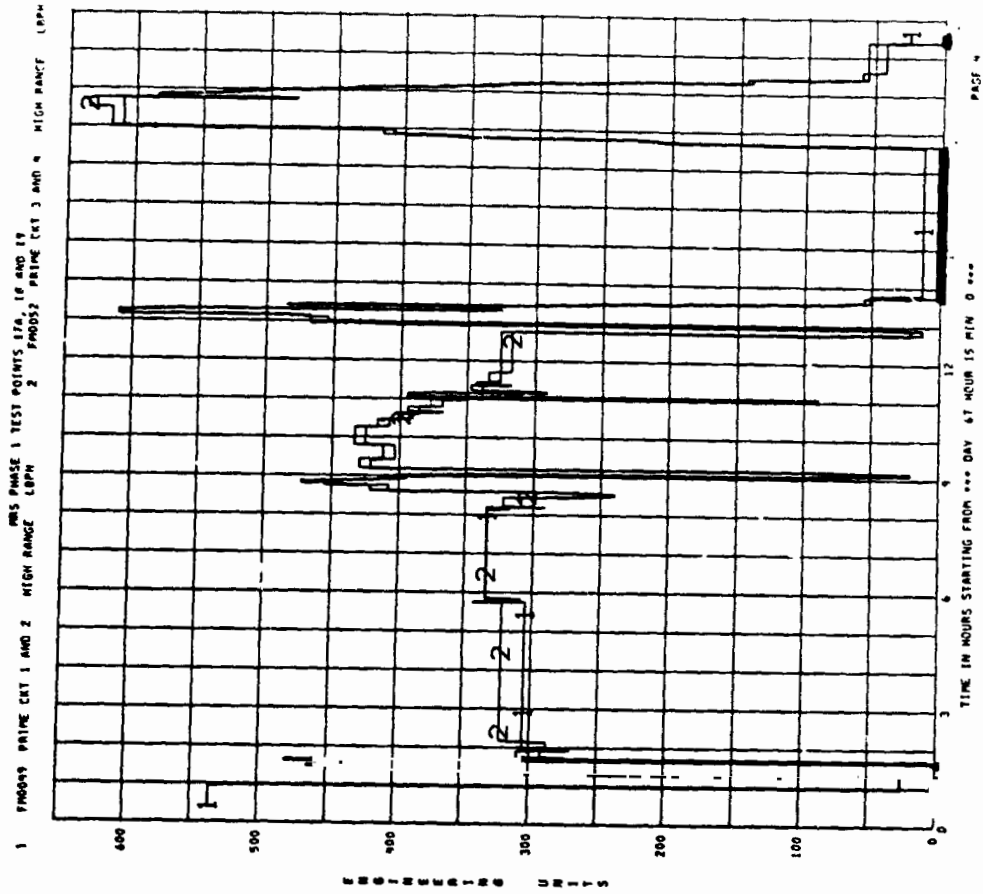
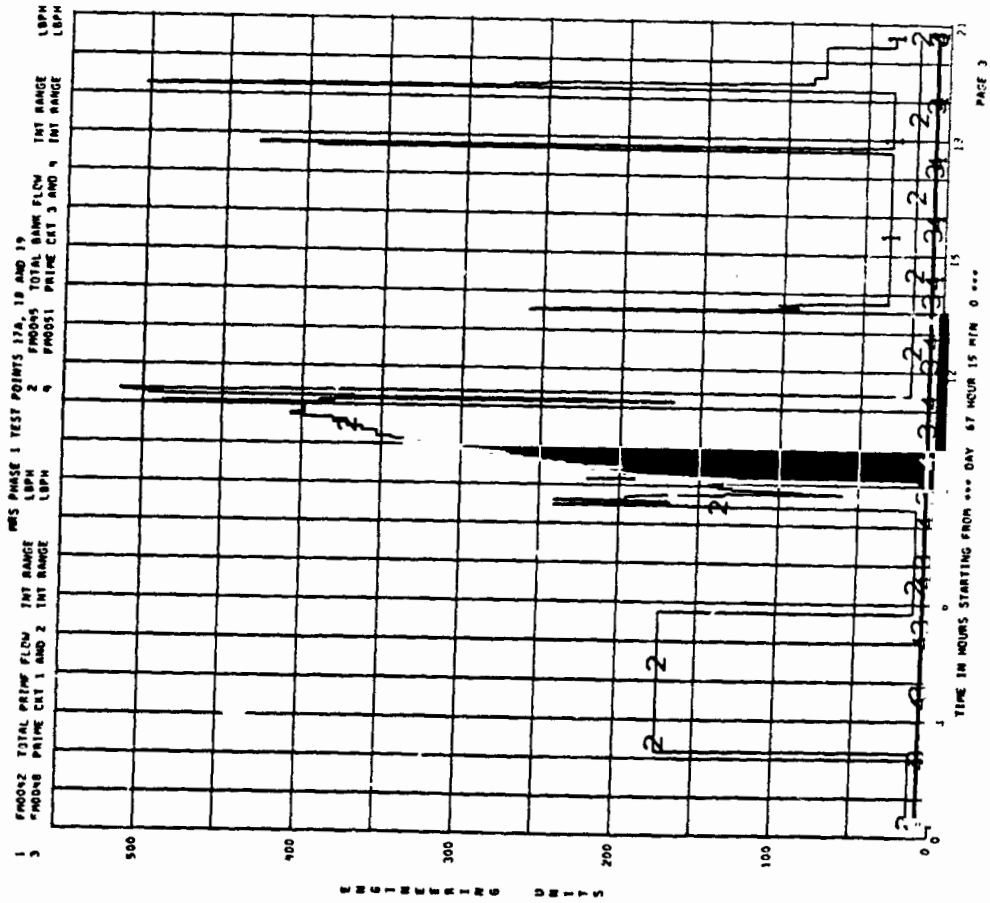
TEST GROUP C

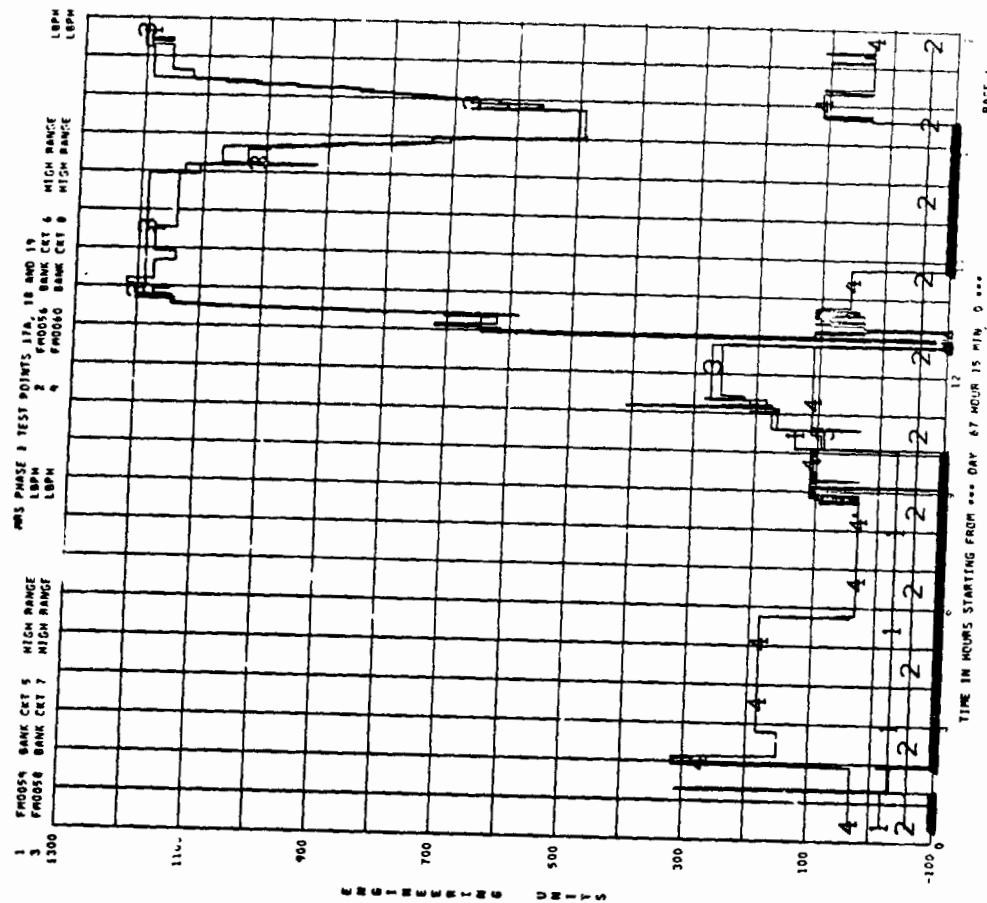
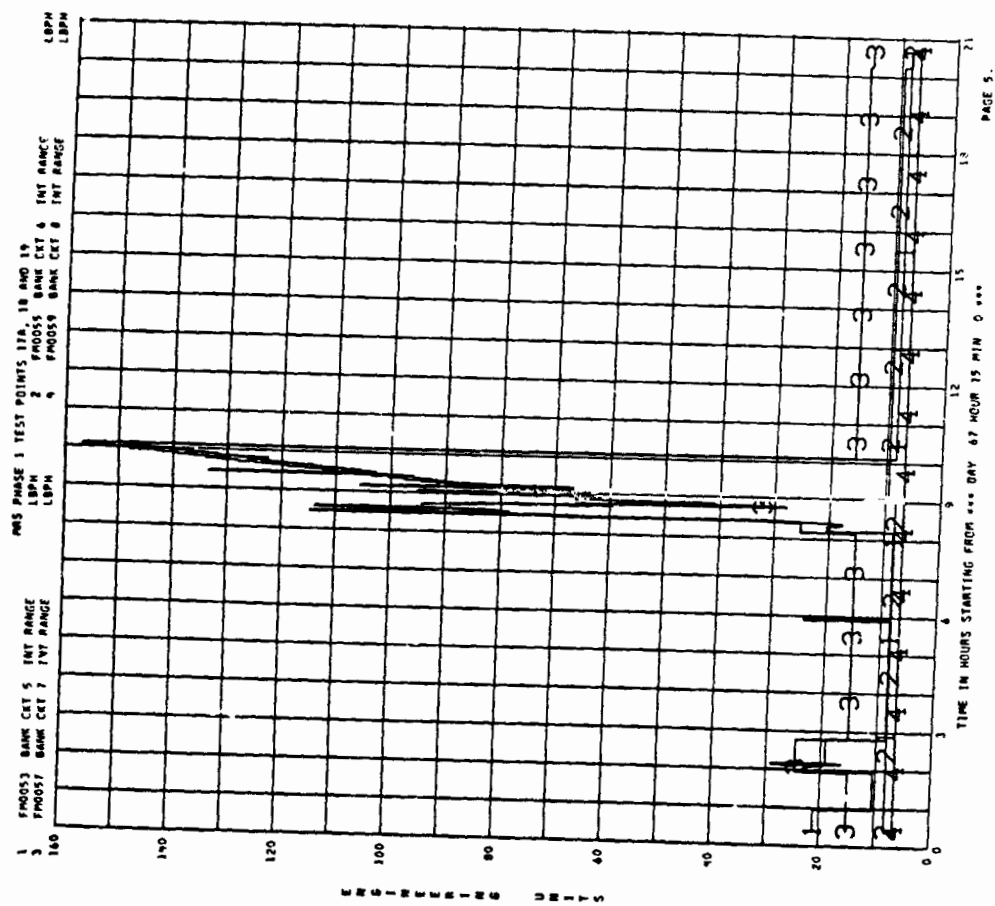
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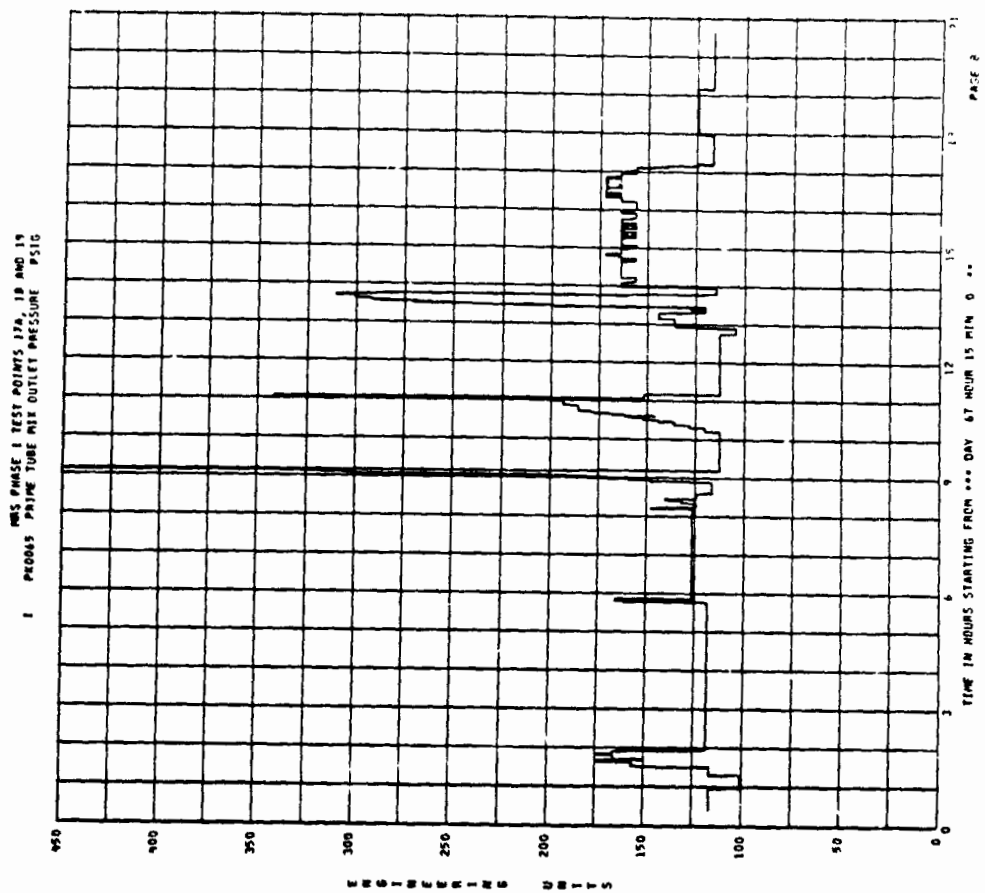
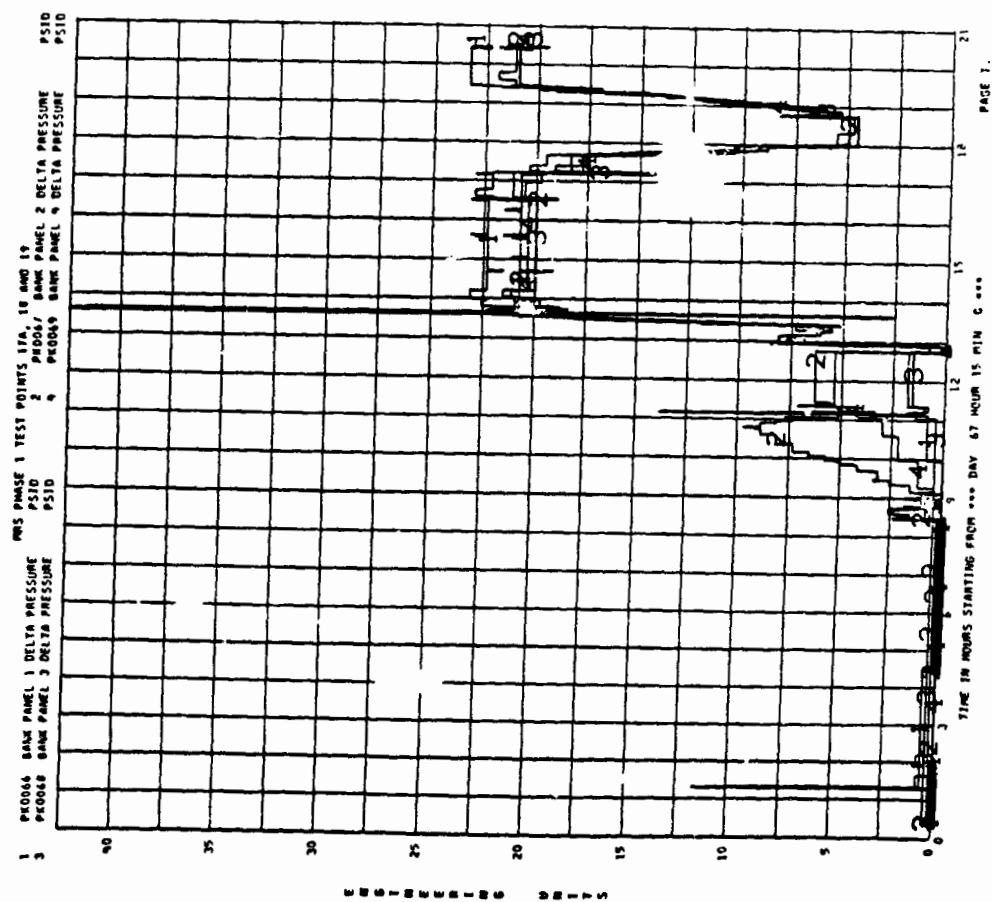
INCLUDES TEST POINTS

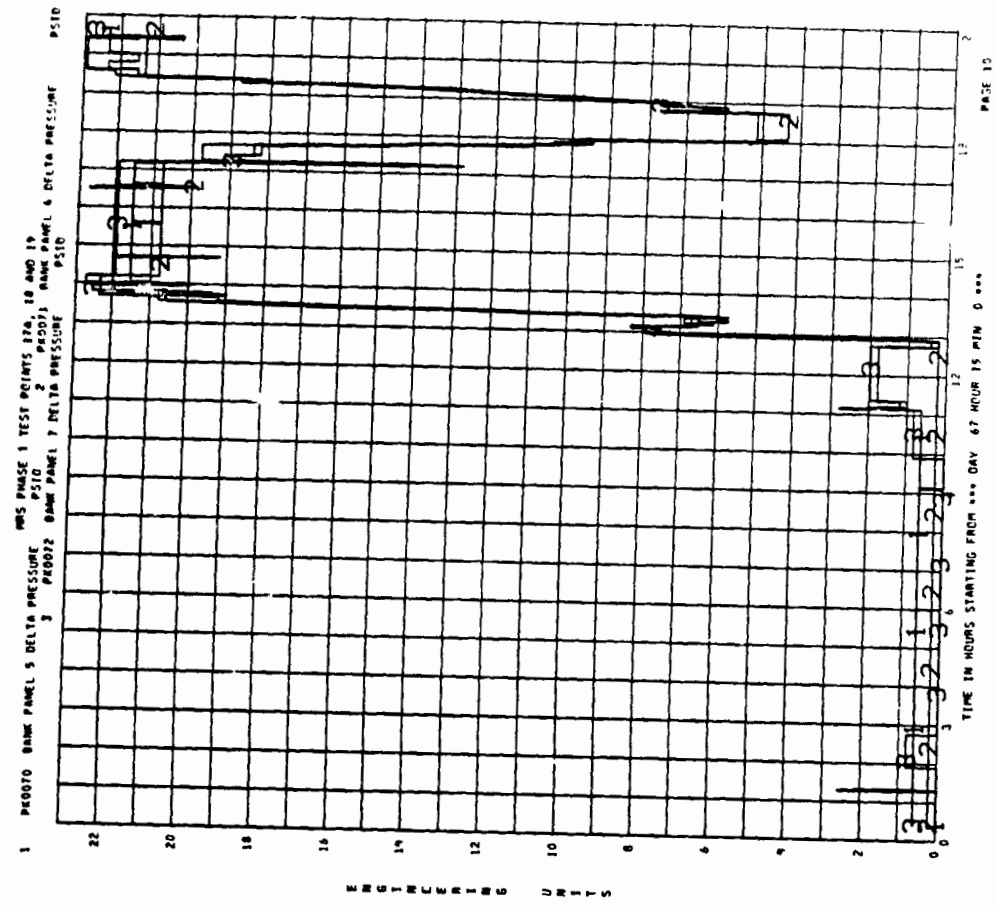
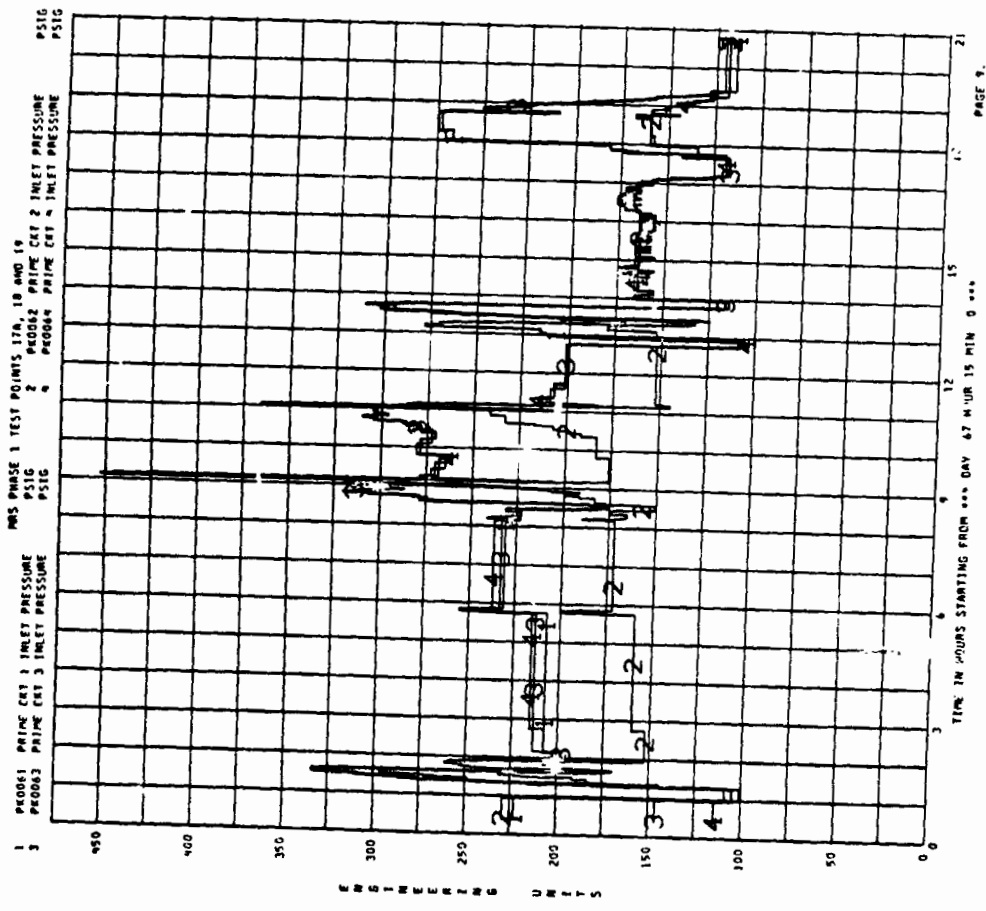
17A
18
19



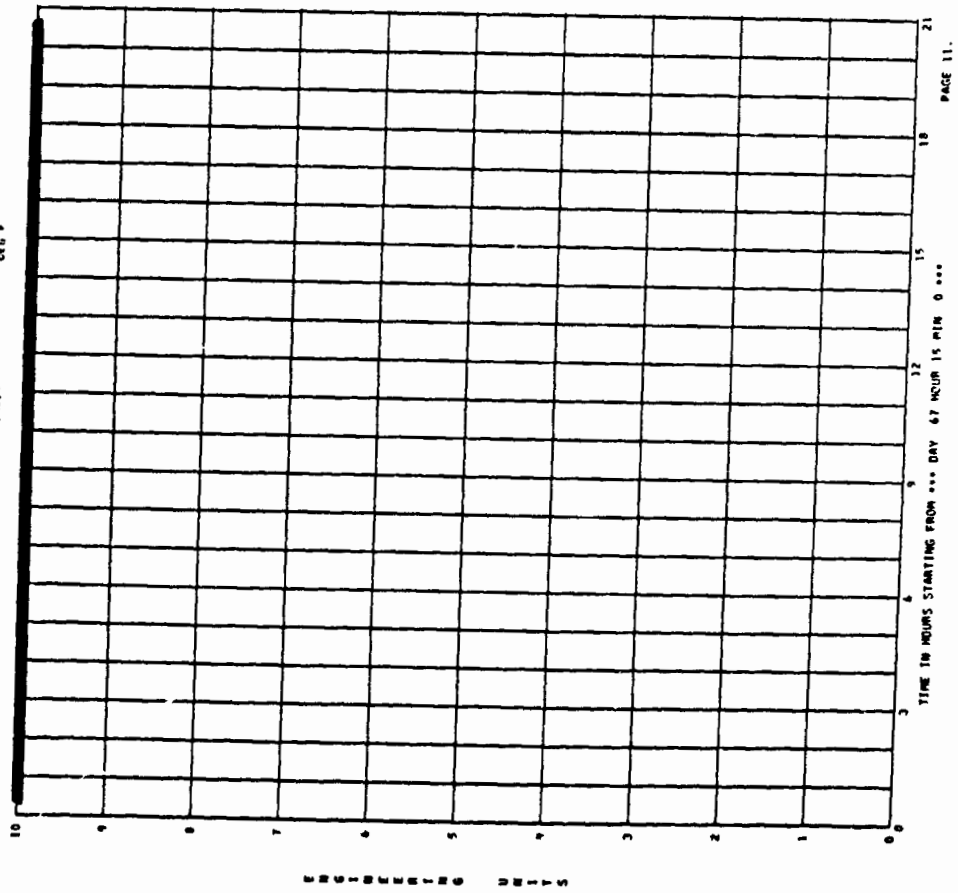






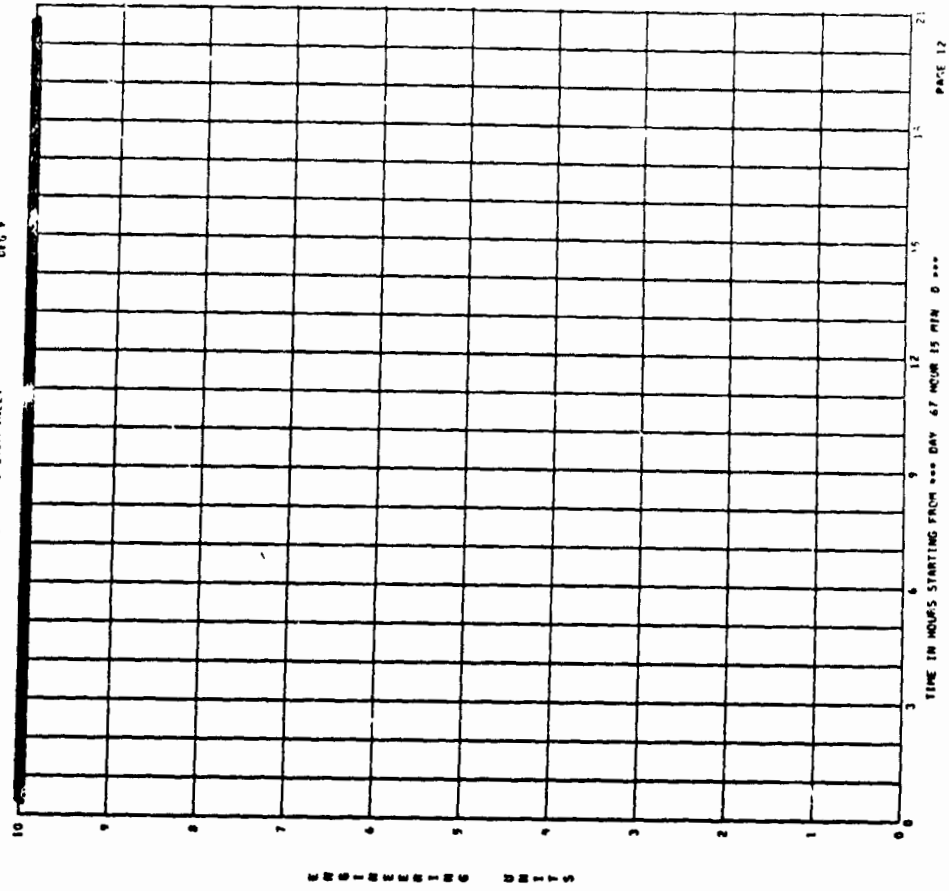


PHS PHASE 1 TEST POINTS 17A, 18 AND 19
 1 A10002 BAW SYSTEM INLET DEG F



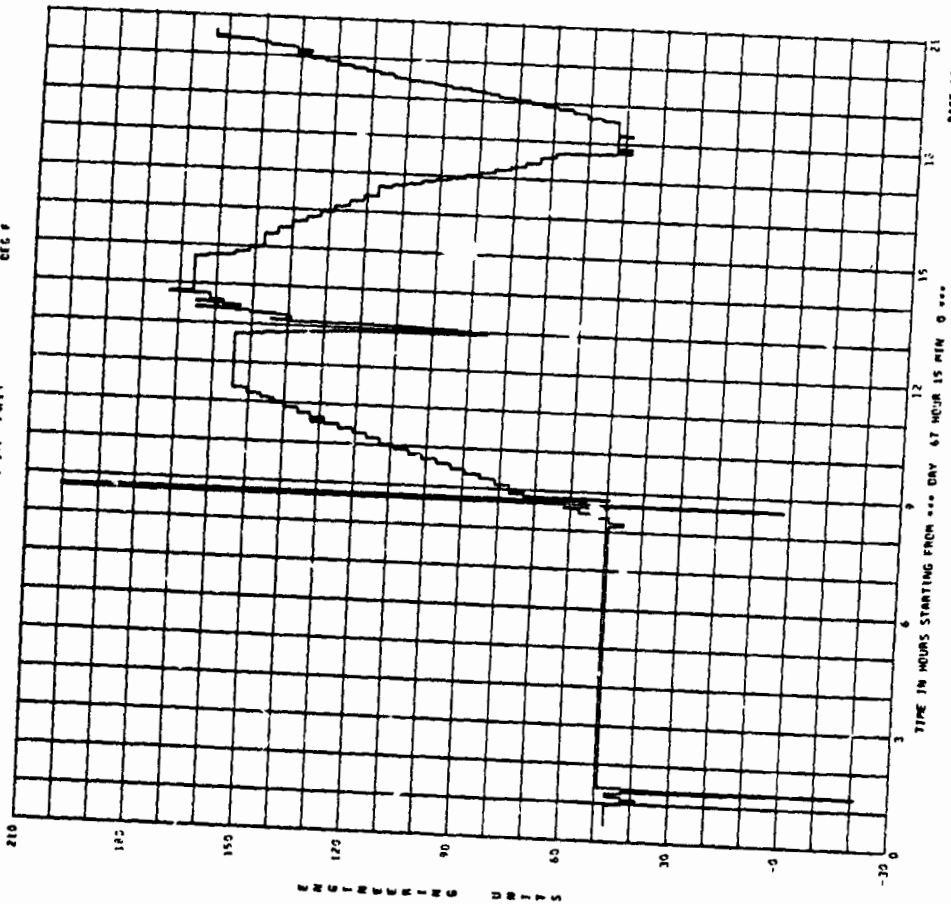
PAGE 11.

PHS PHASE 1 TEST POINTS 17A, 18 AND 19
 1 A10002 BAW SYSTEM INLET DEG F

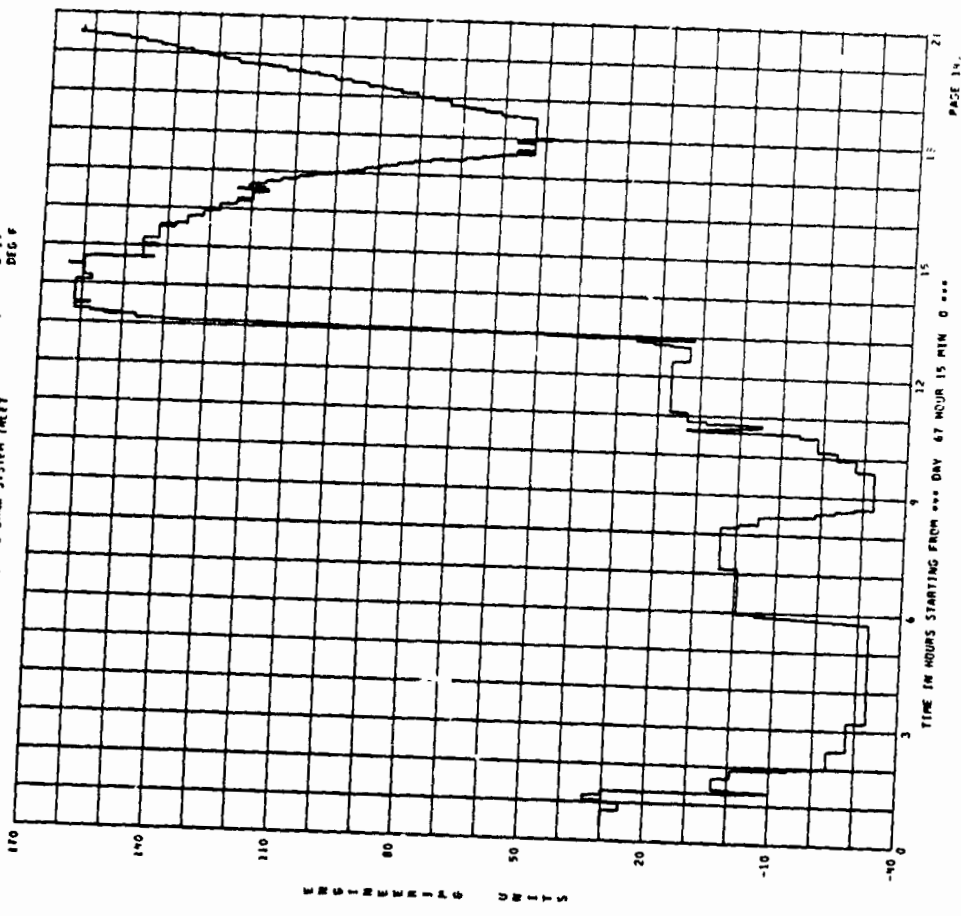


PAGE 12

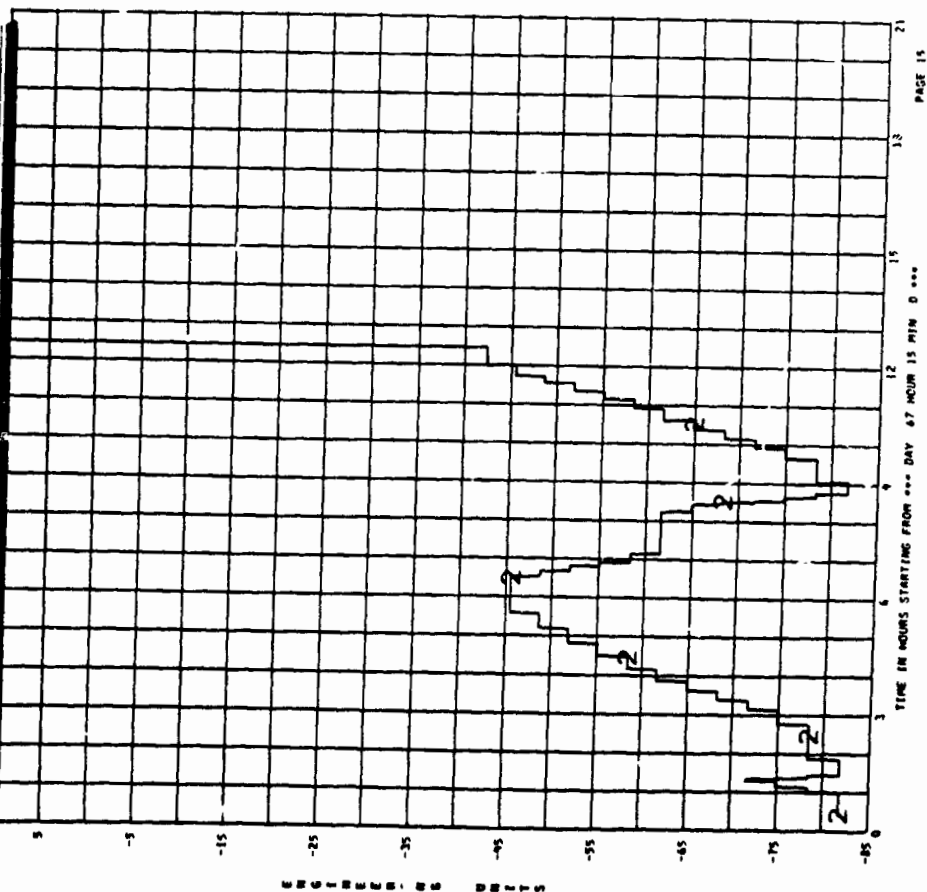
1 A10002 BANG SYSTEM INLET



1 A10002 BANG SYSTEM INLET

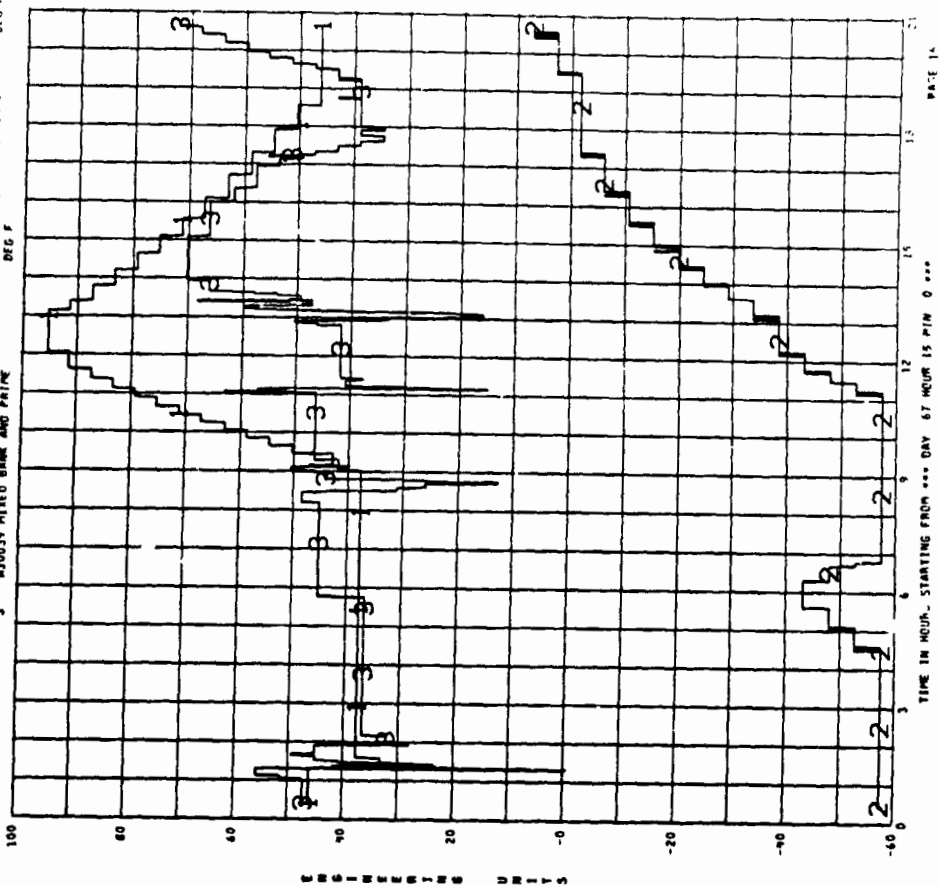


1 A10019 PRIME TUBES OUTLET MIX IN CM DEG F
 2 A10034 BANK TUBES OUTLET MIX IN CM DEG F
 3 A10039 MIXED BANK AND PRIME DEG F

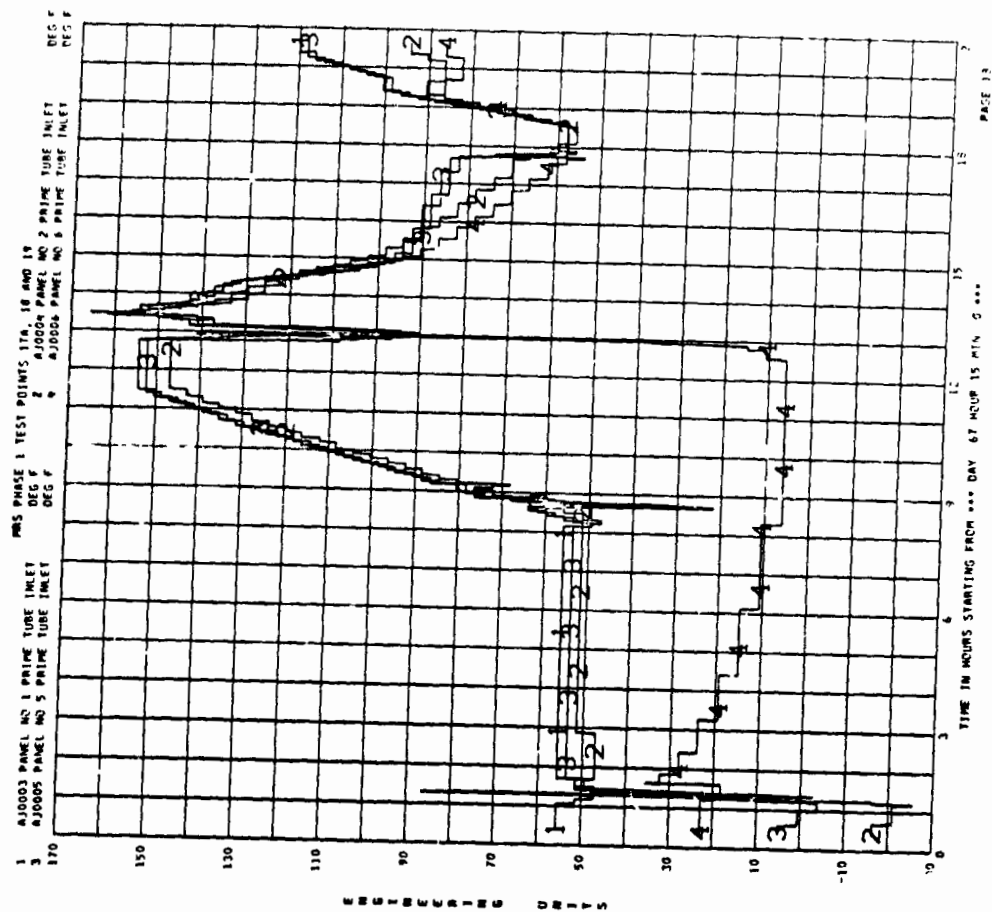
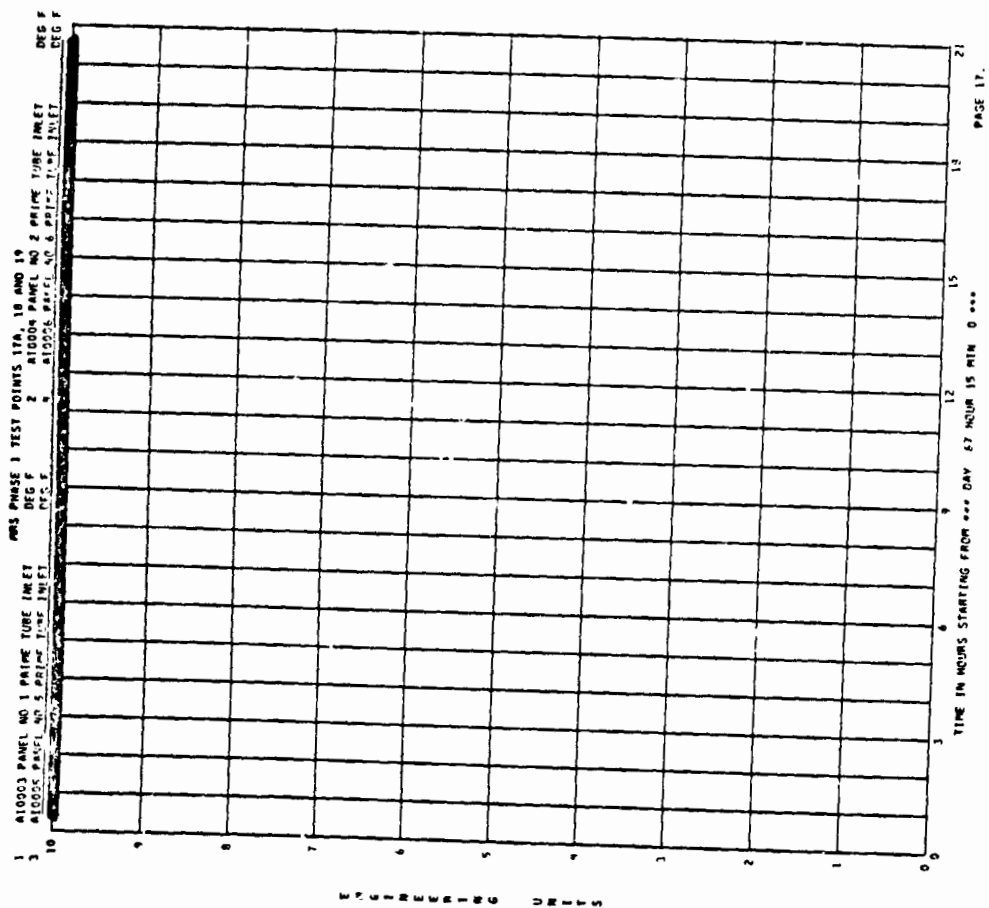


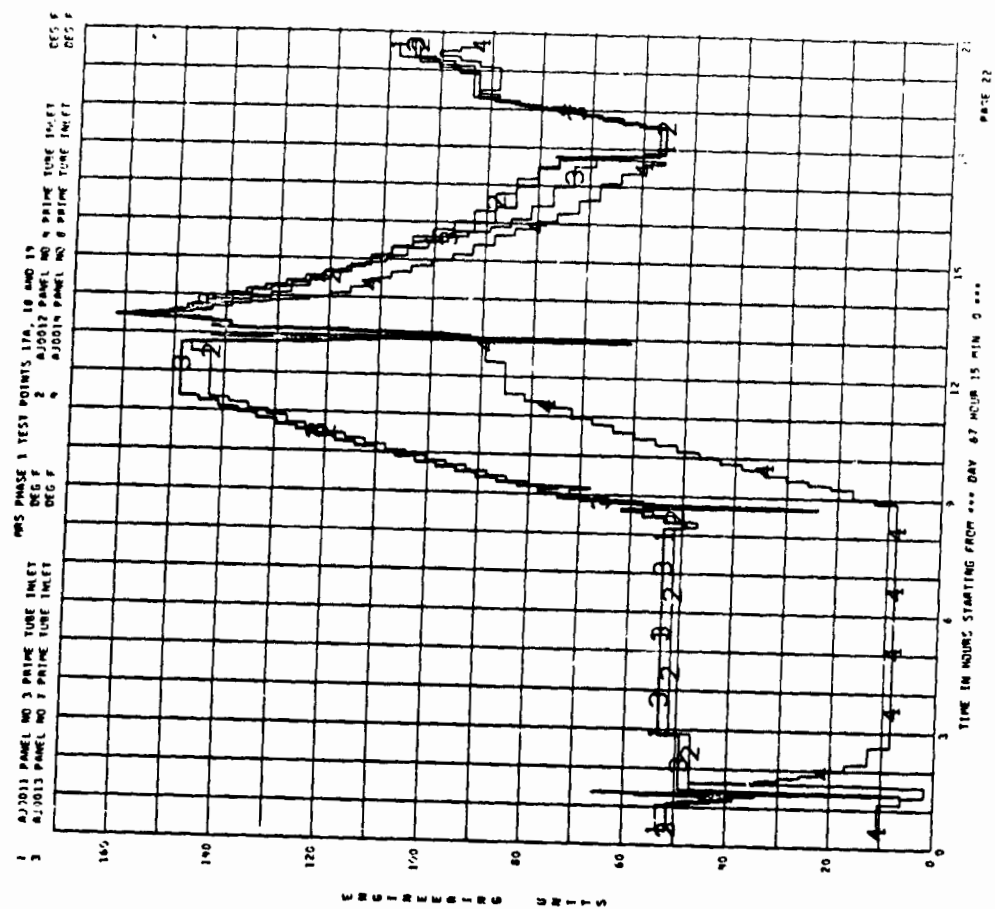
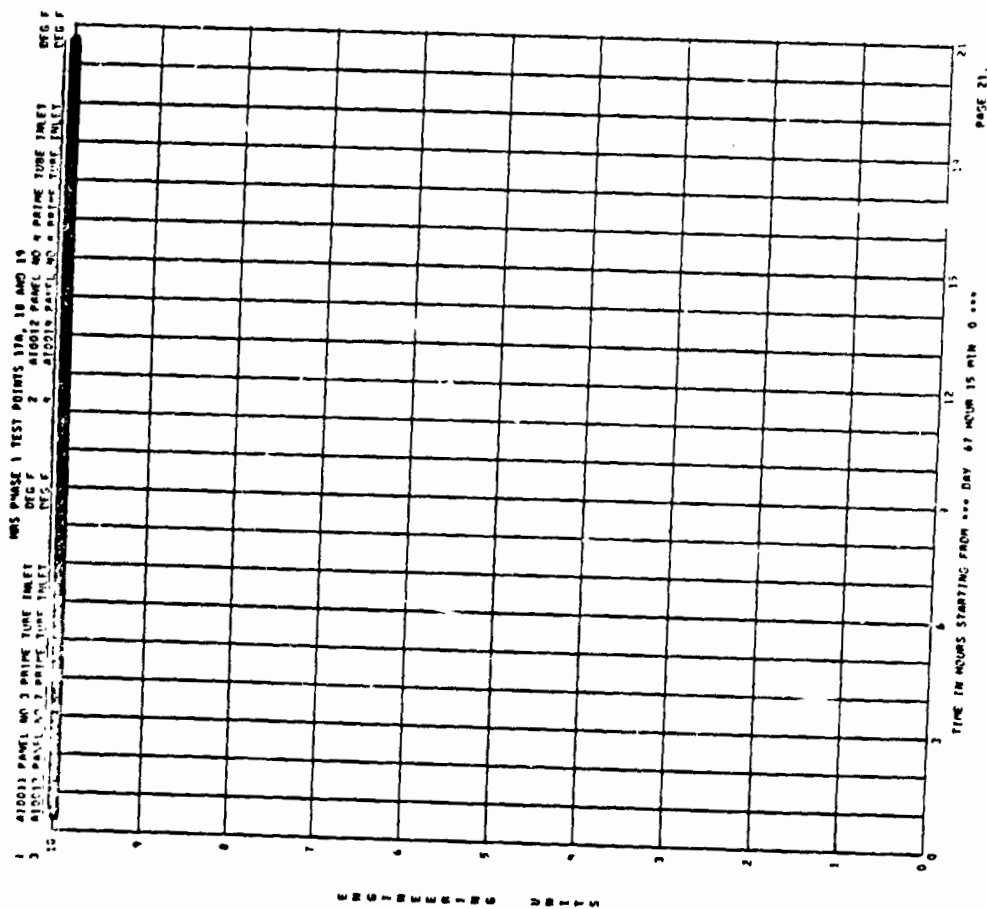
PAGE 15

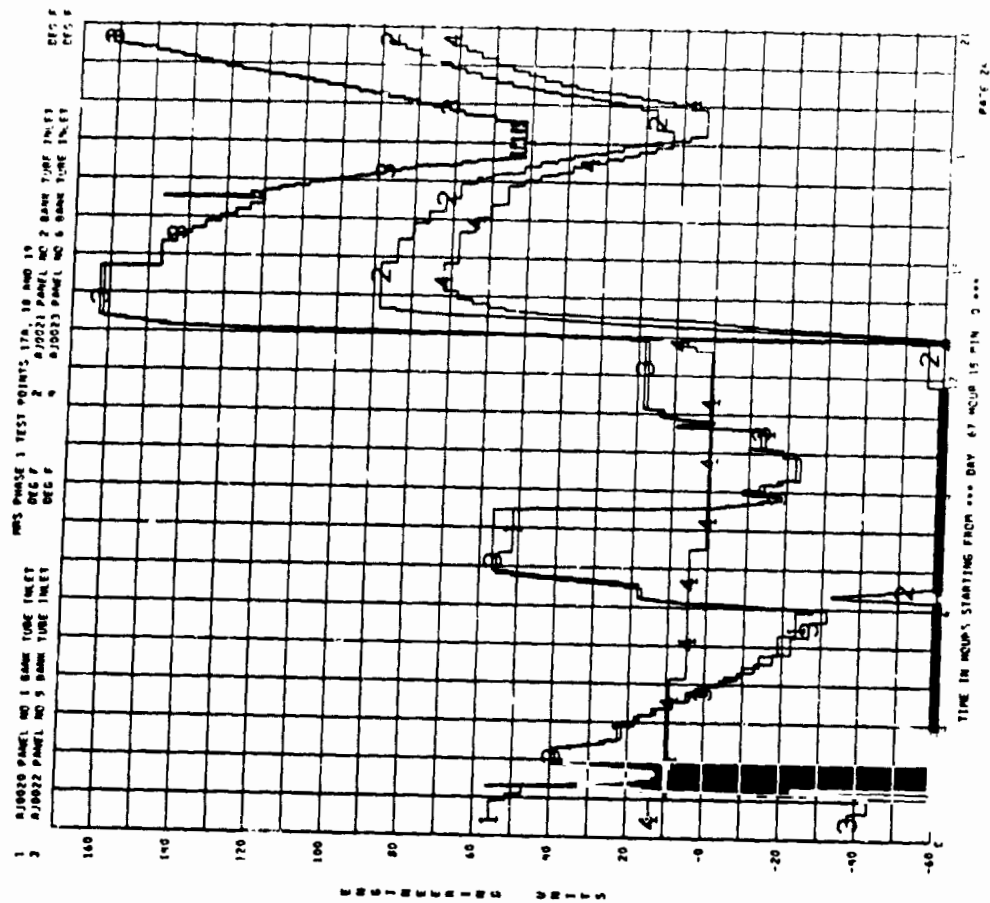
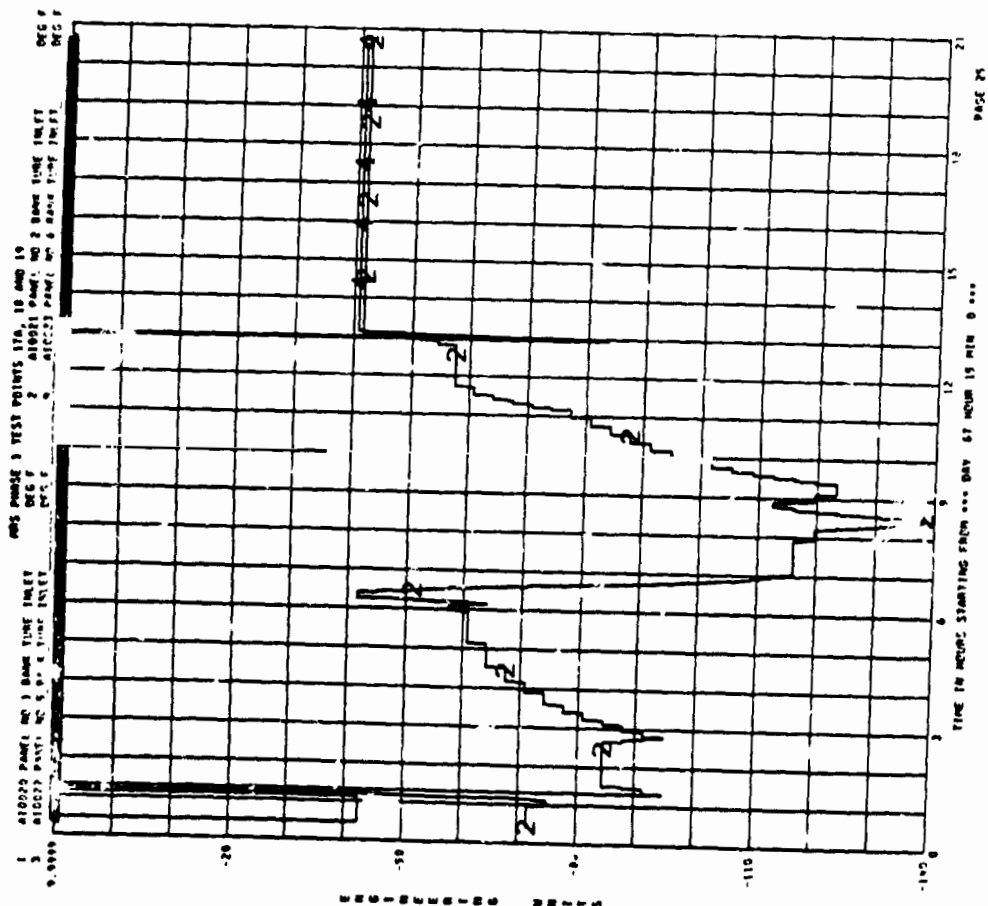
1 A10019 PRIME TUBES OUTLET MIX IN CM DEG F
 2 A10034 BANK TUBES OUTLET MIX IN CM DEG F
 3 A10039 MIXED BANK AND PRIME DEG F

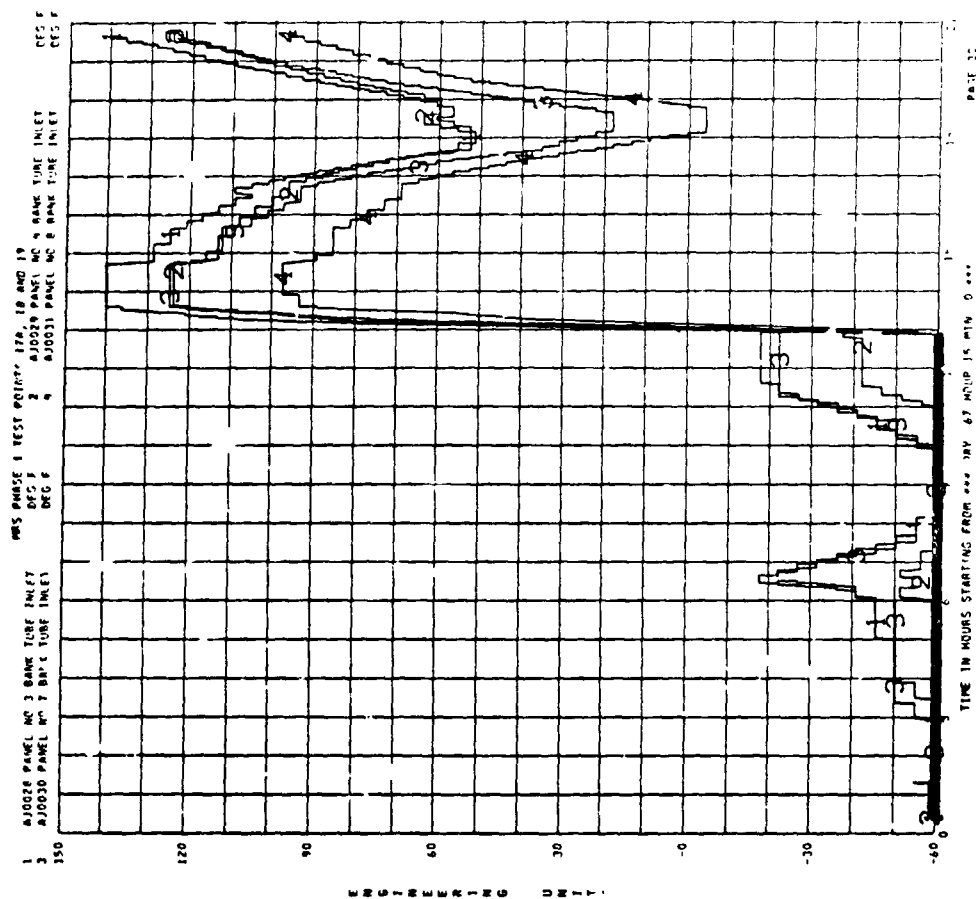
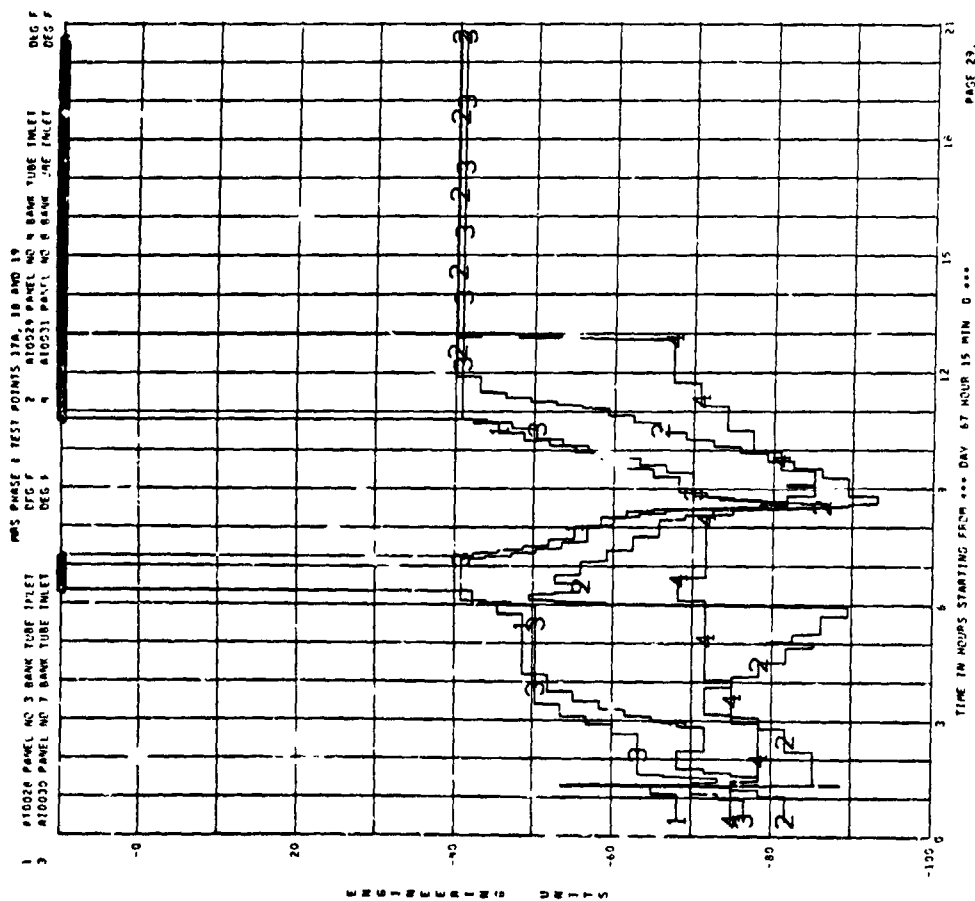


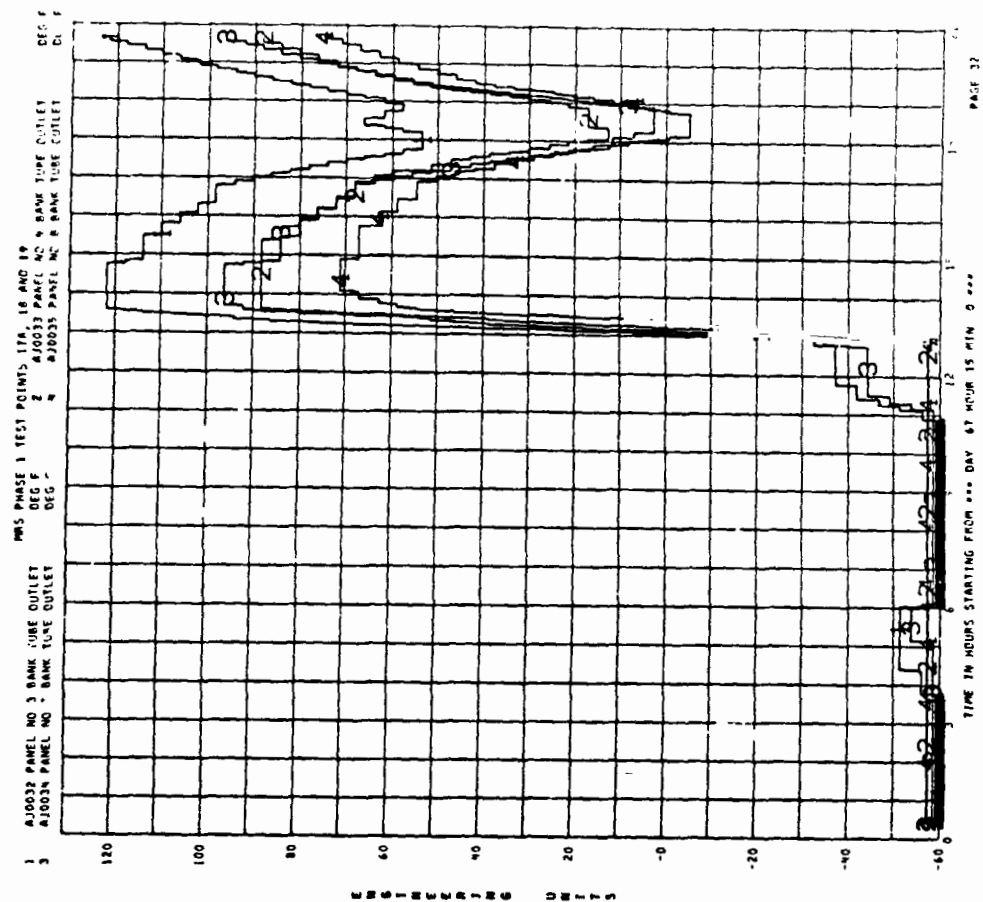
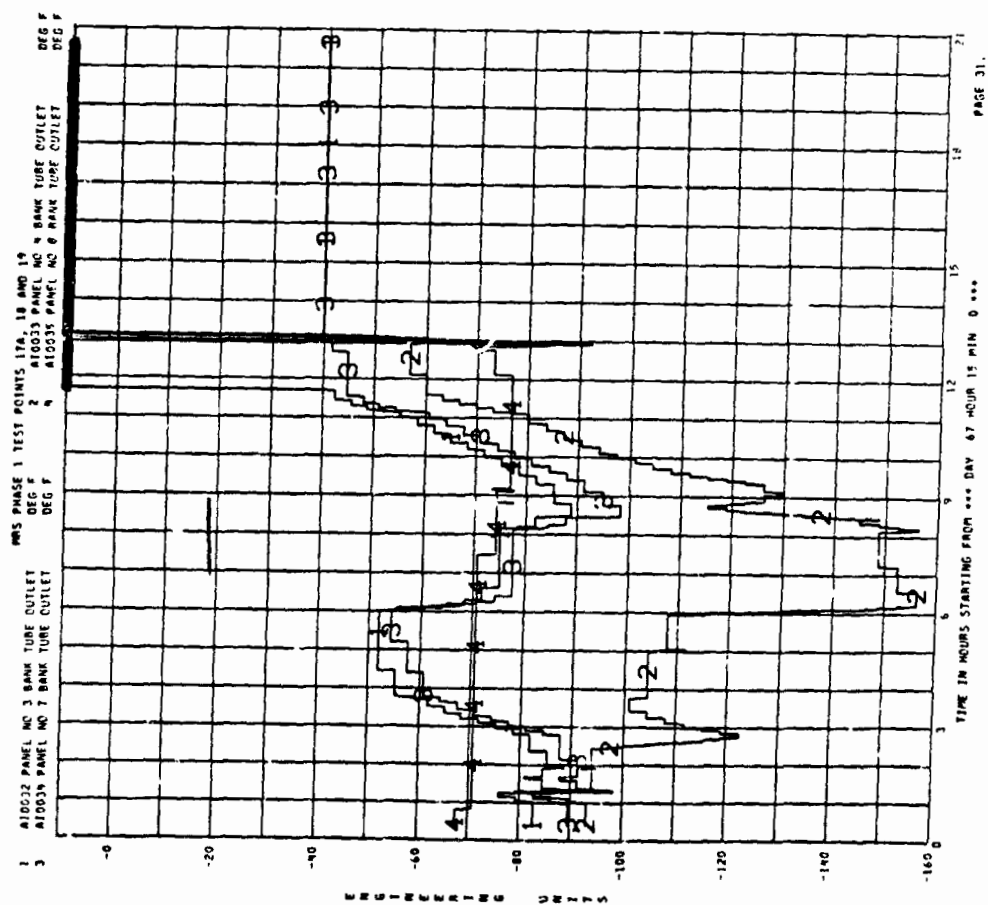
PAGE 16

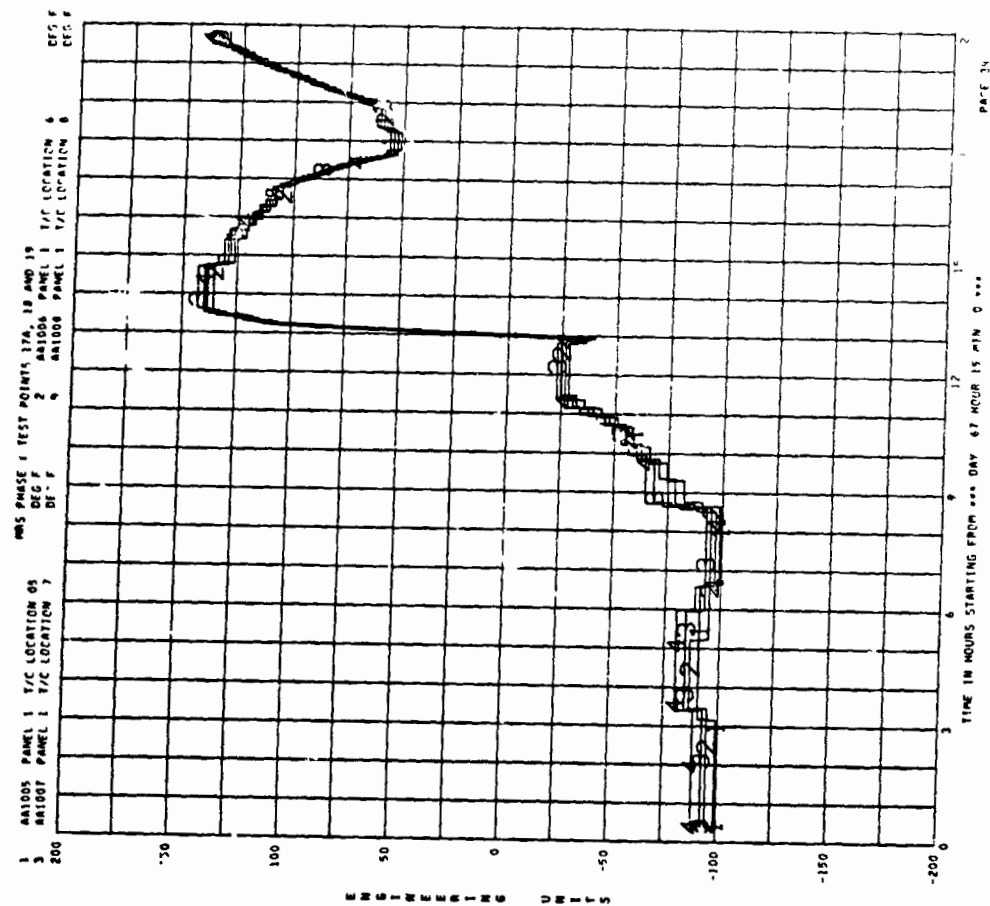
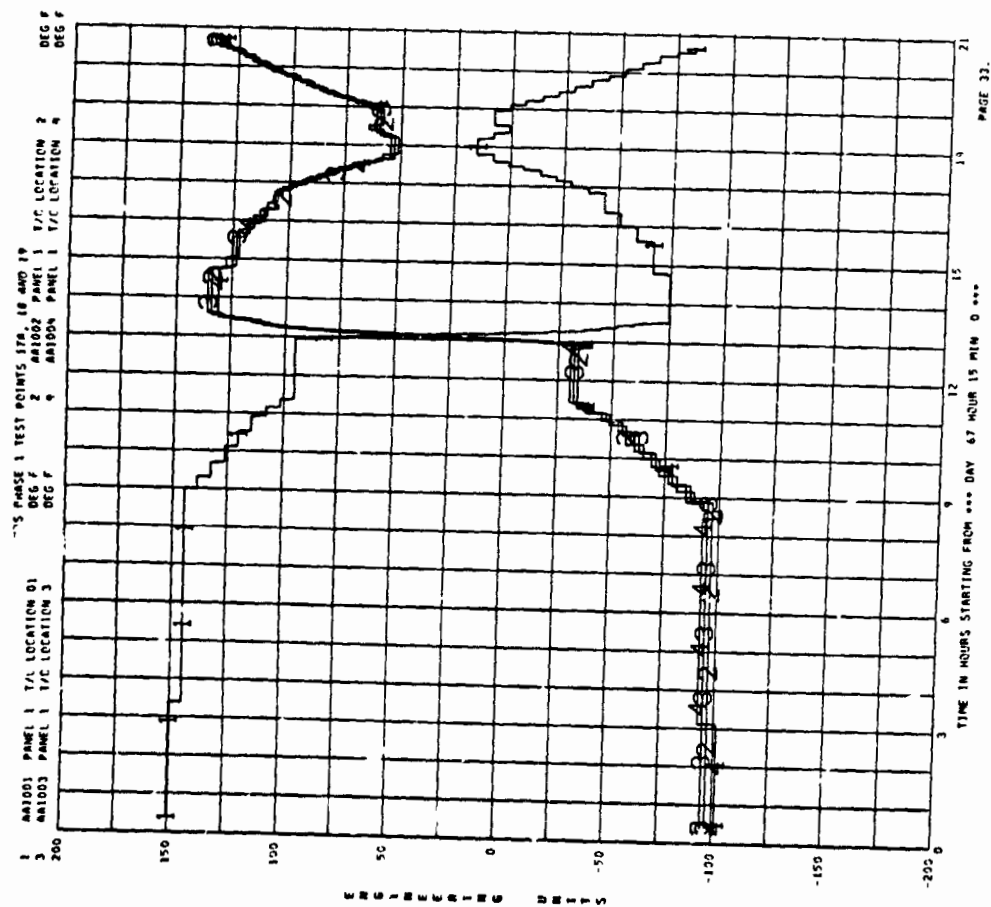


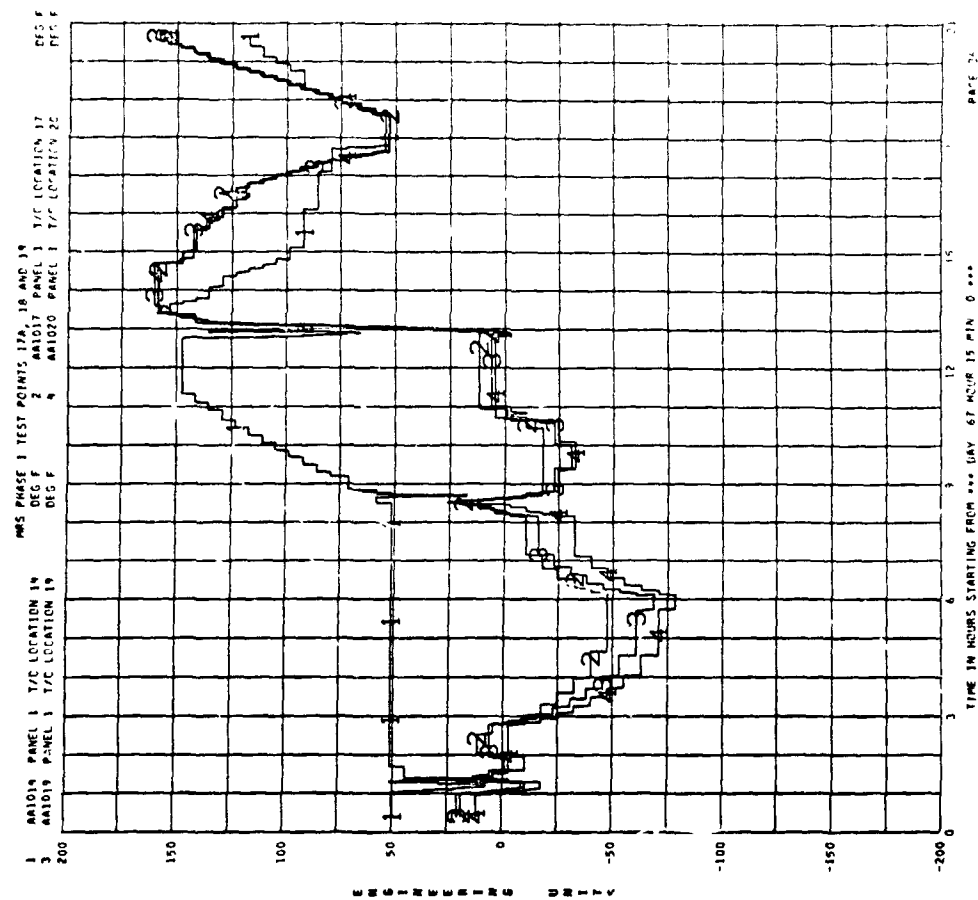
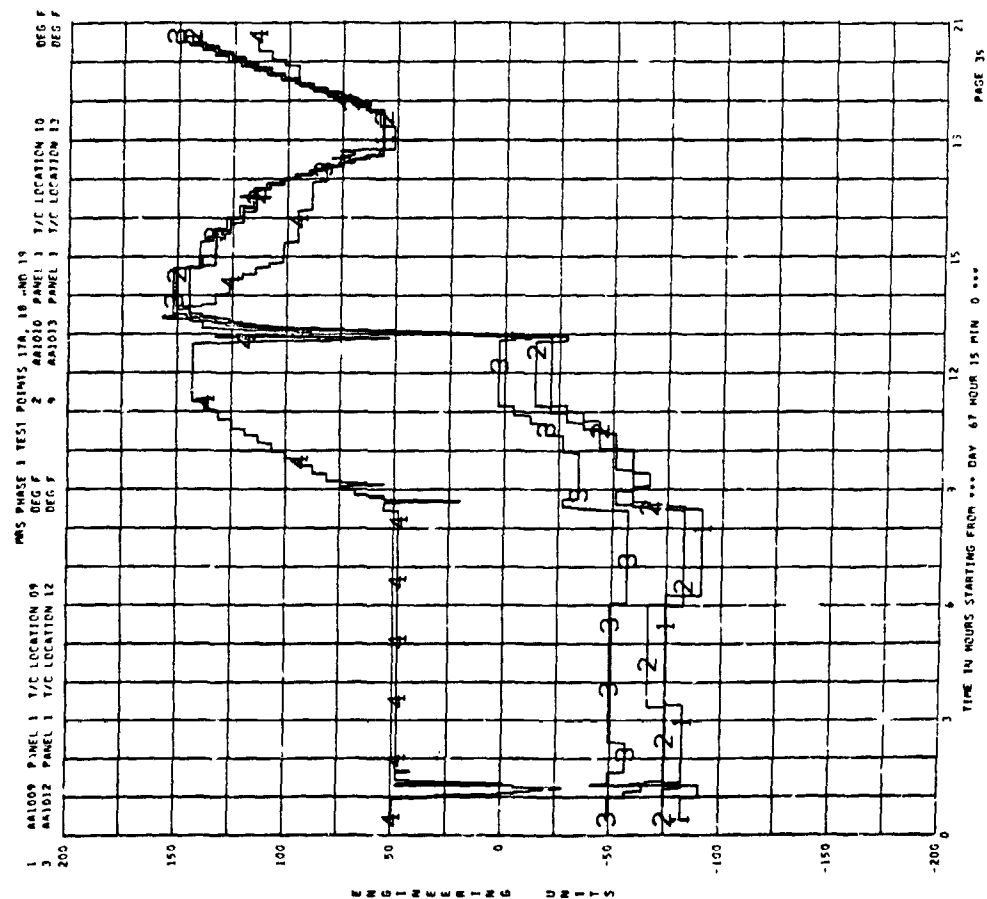


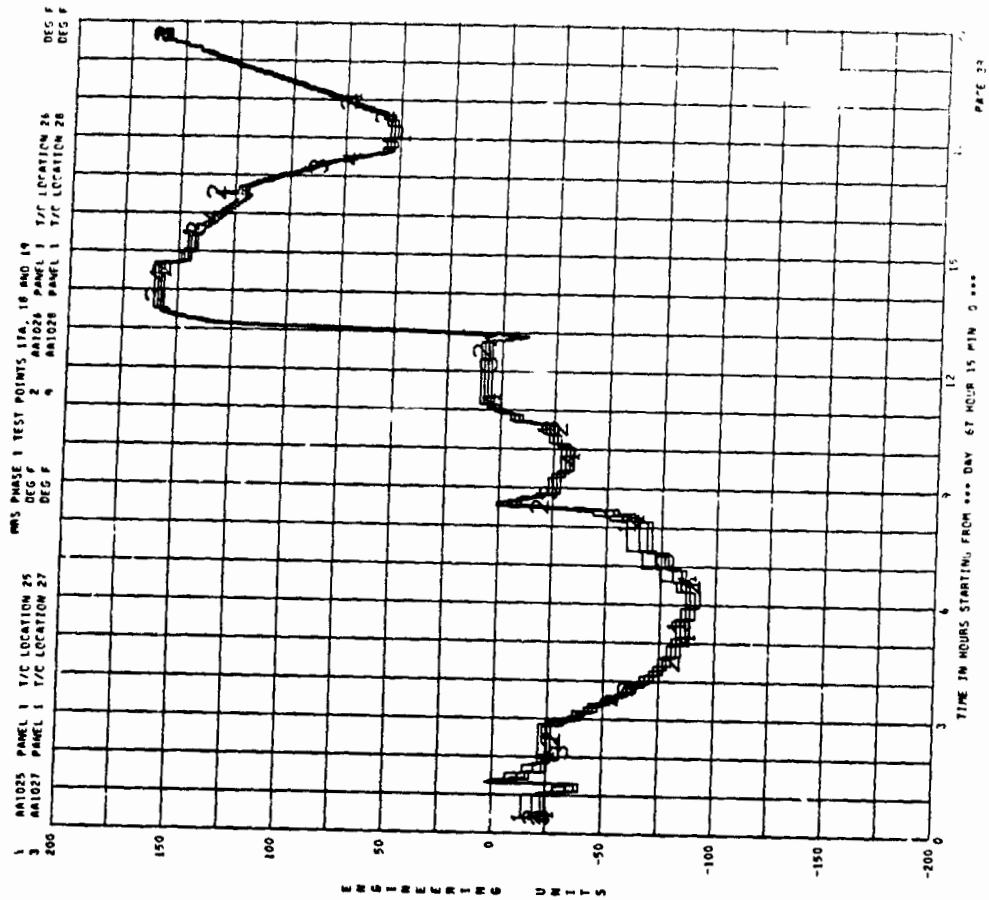
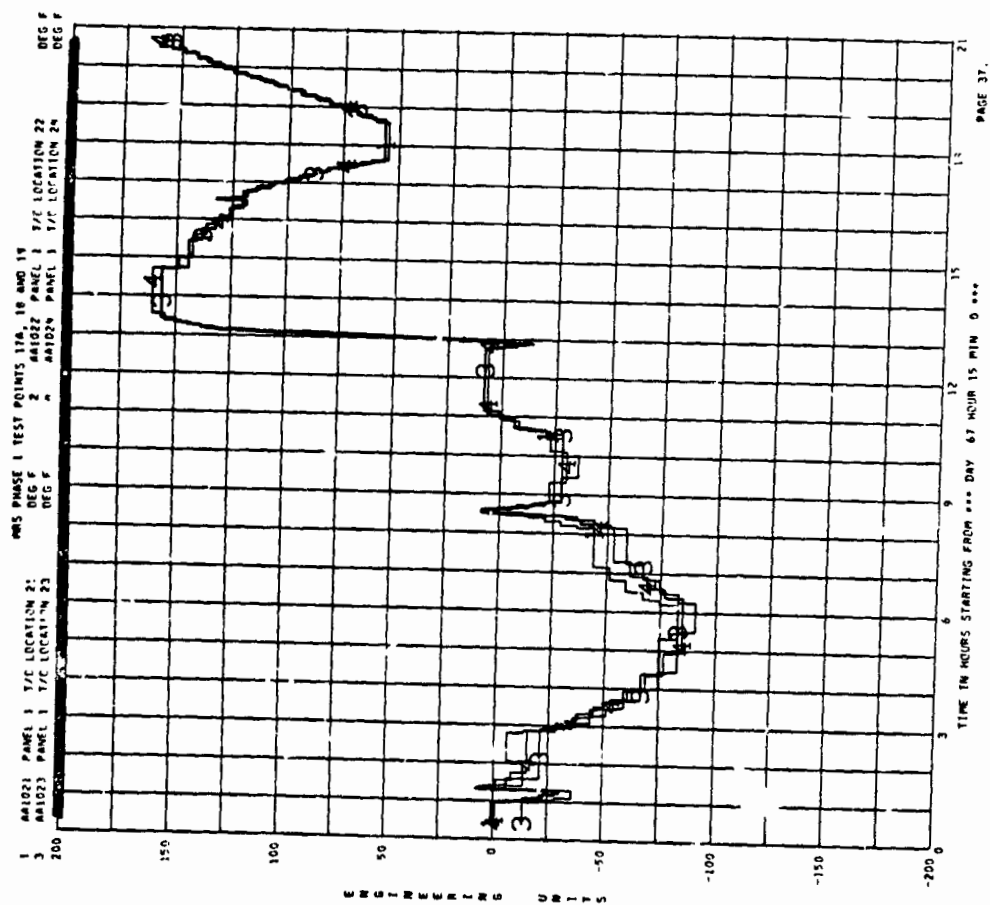


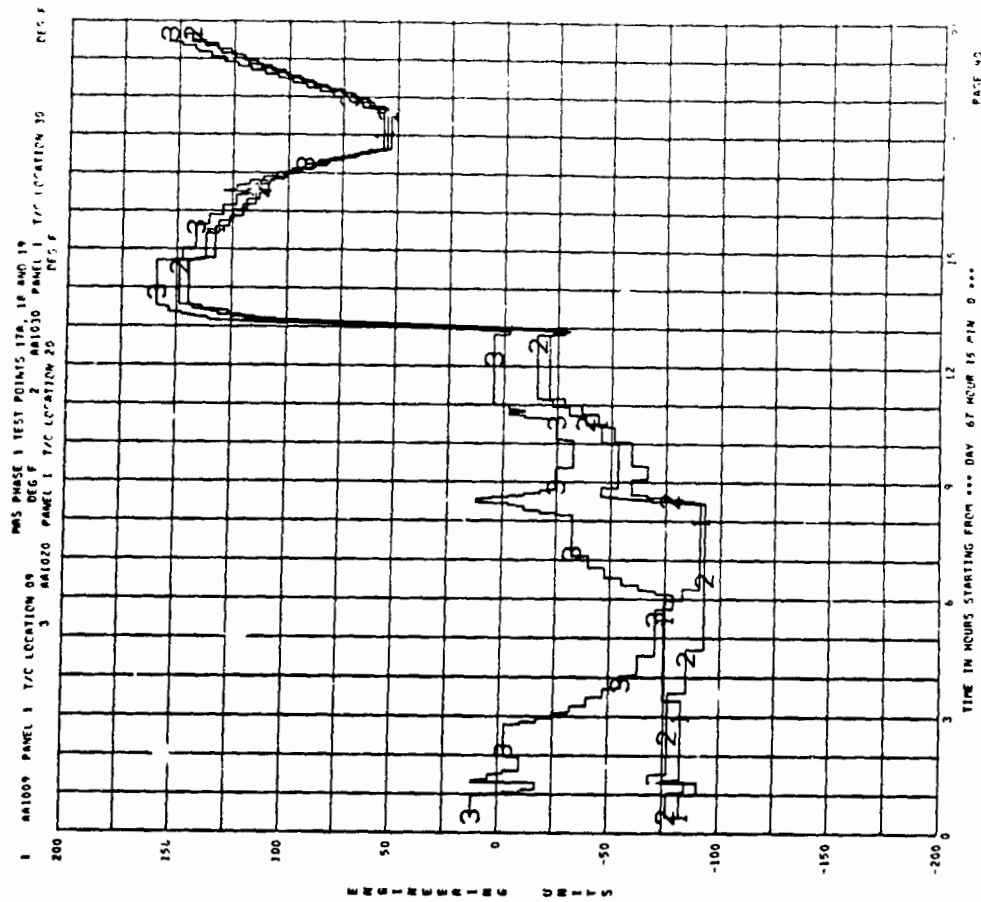
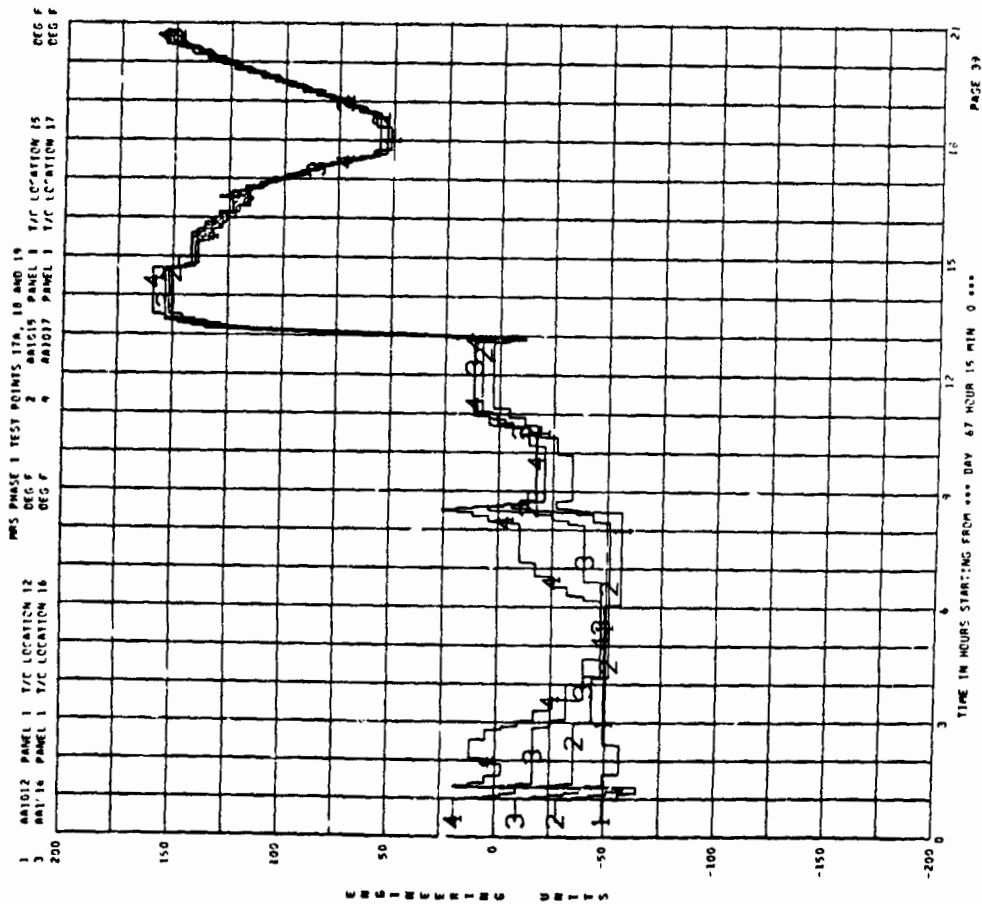


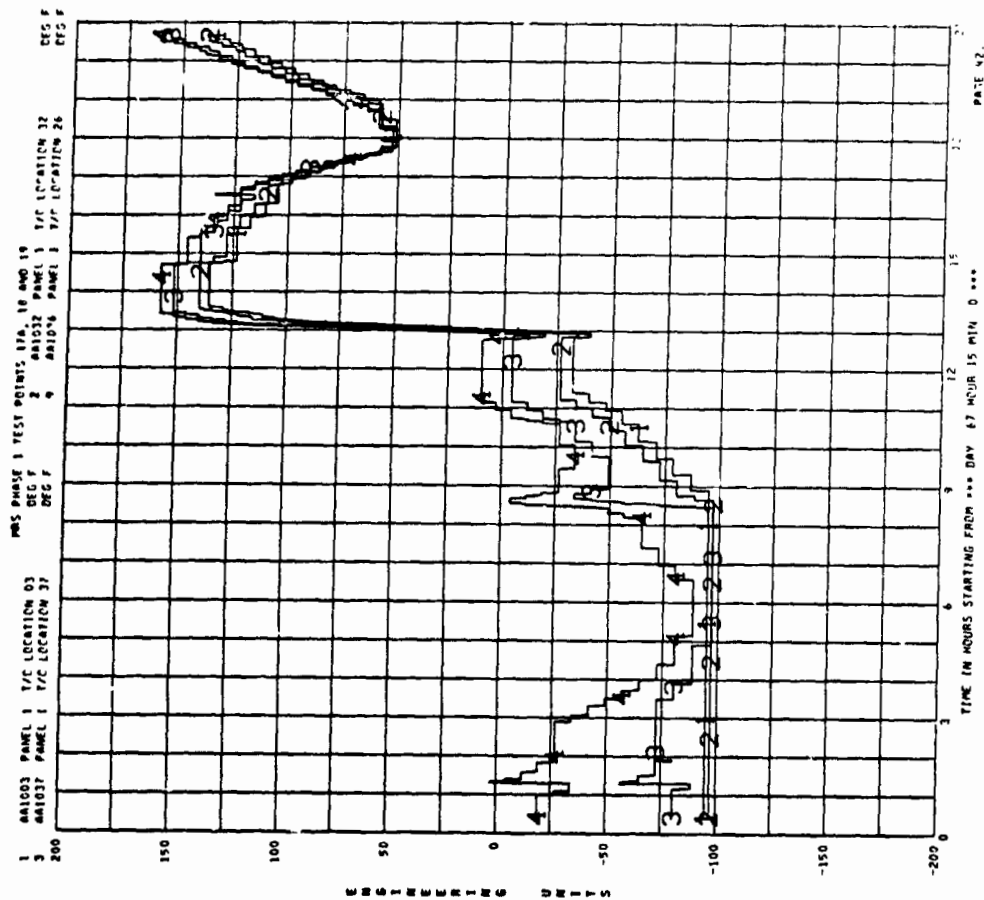
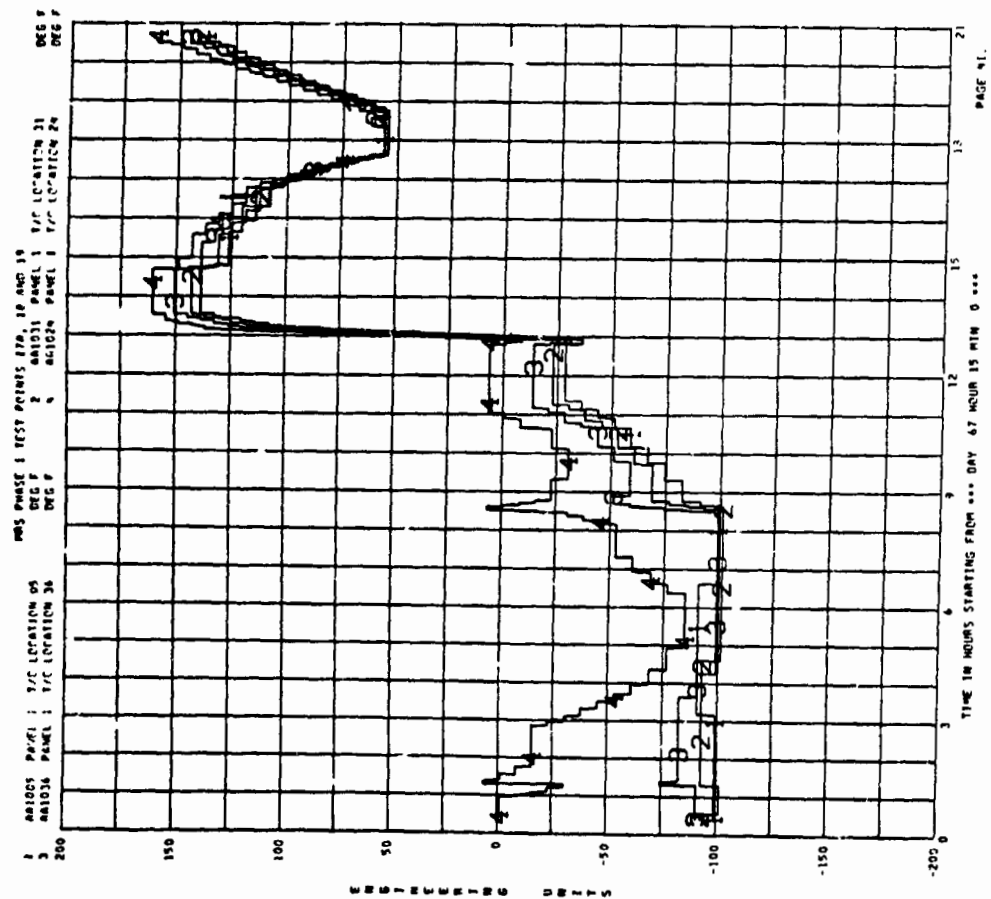


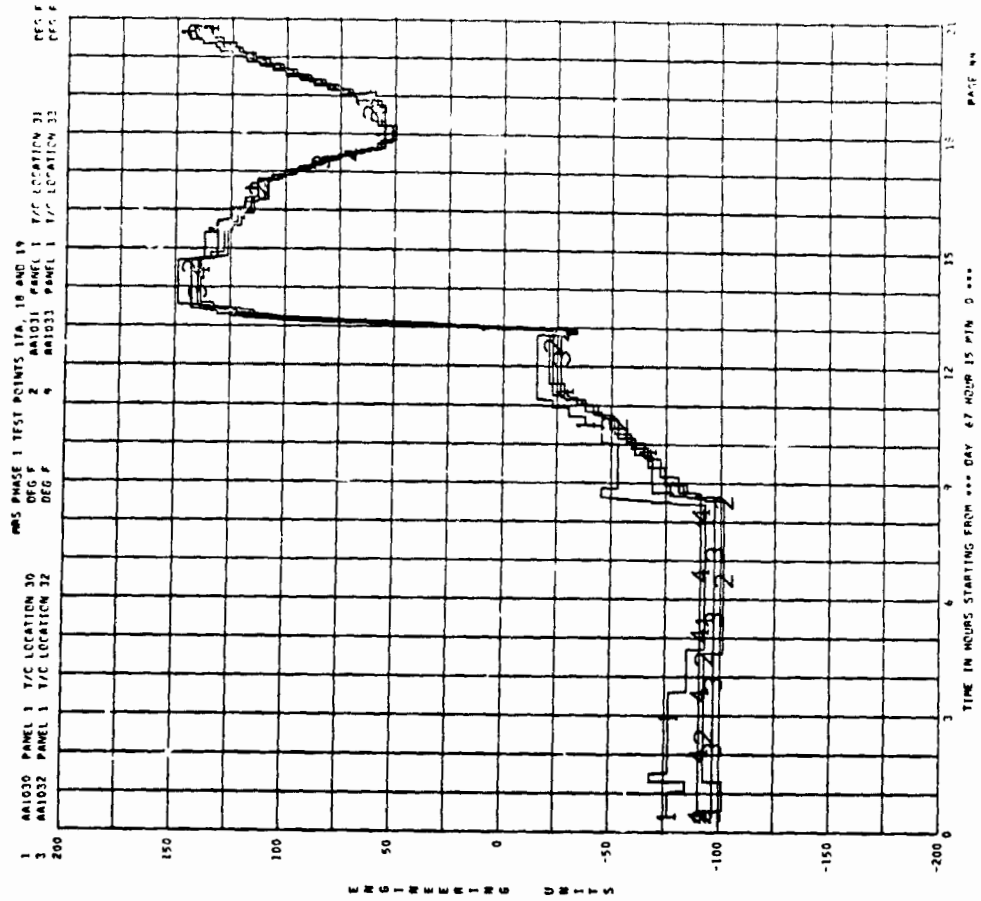
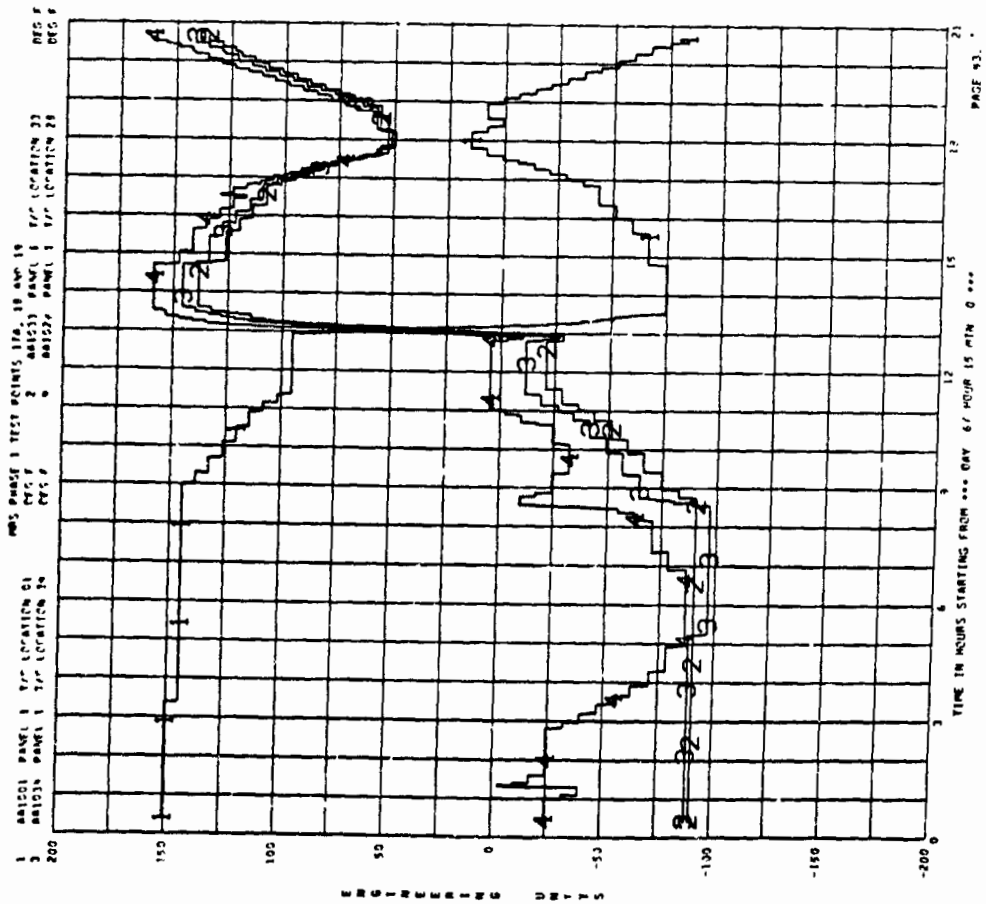


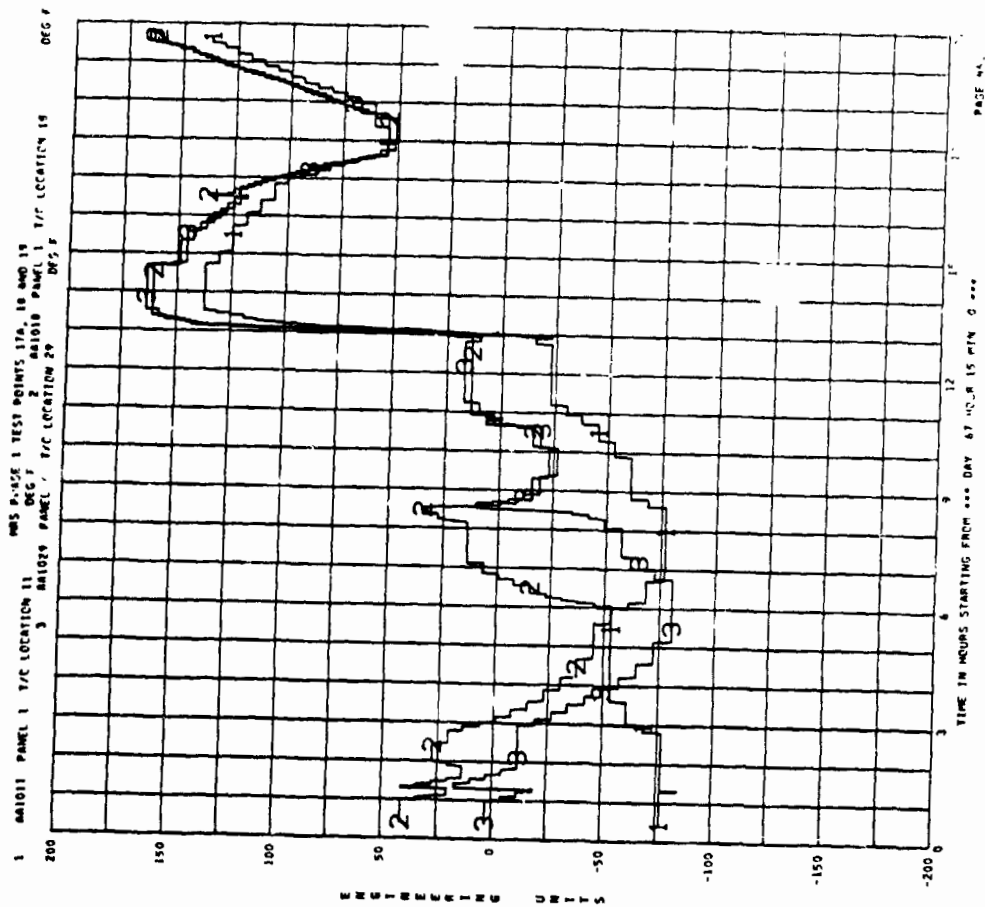
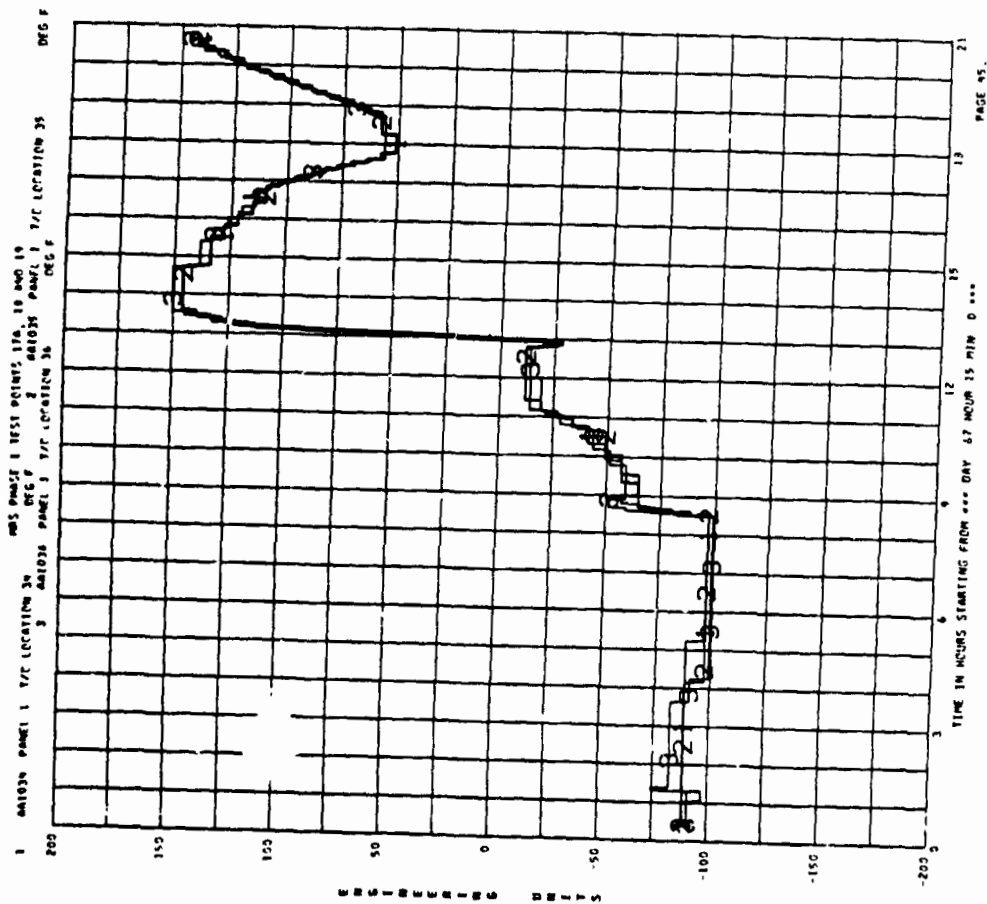


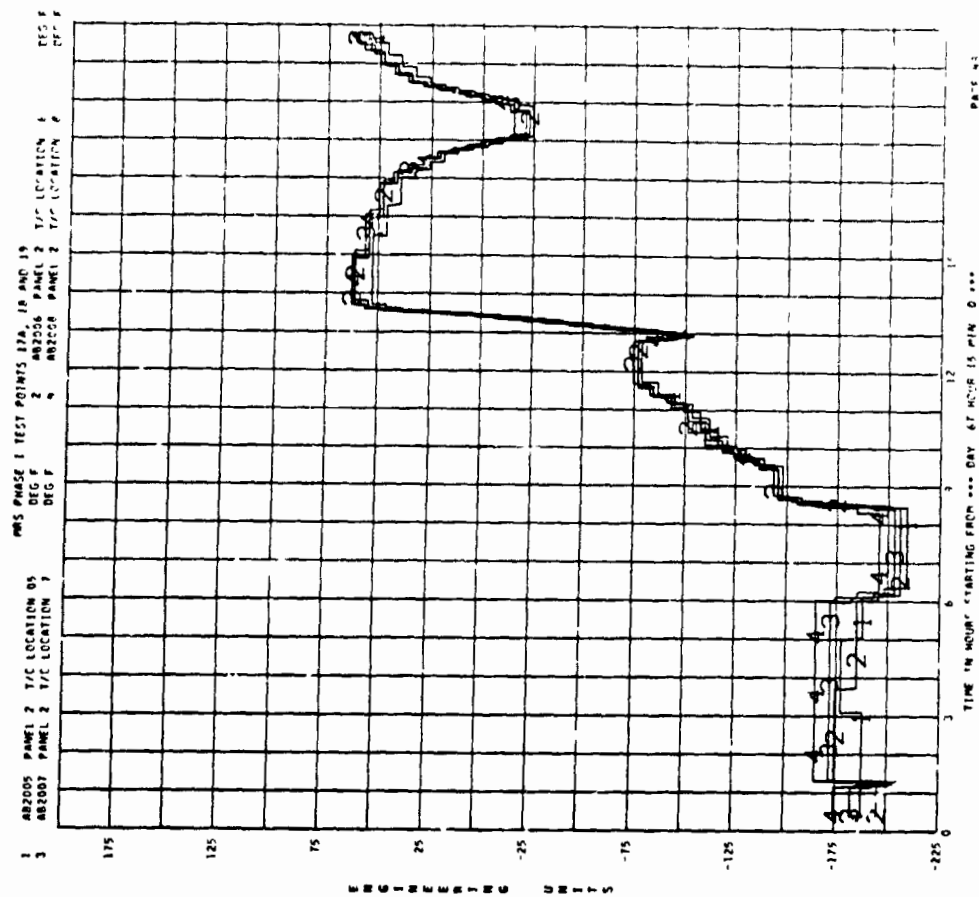
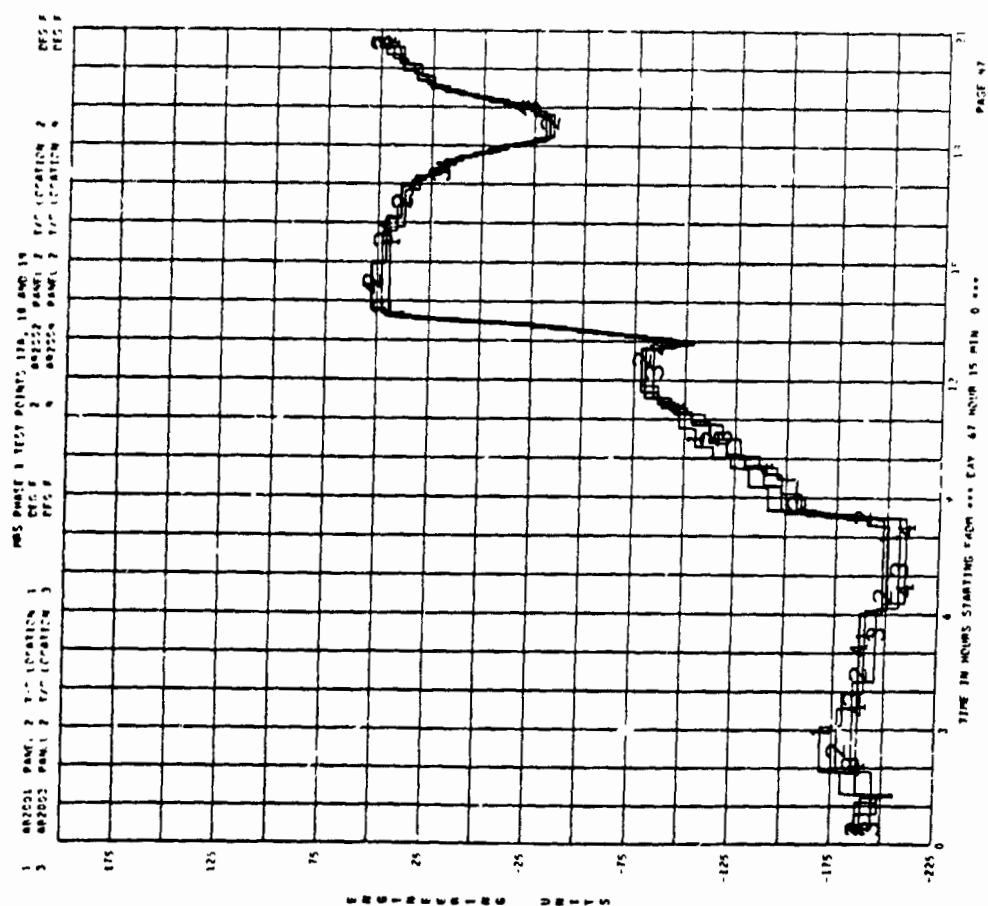


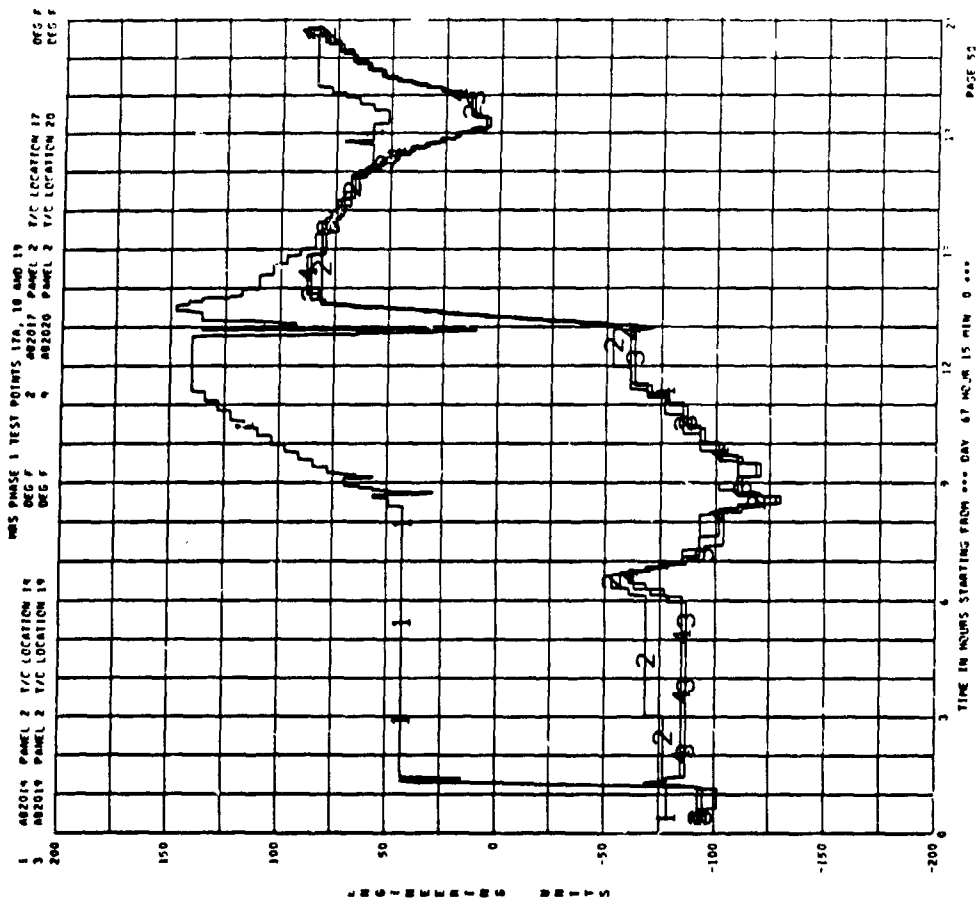
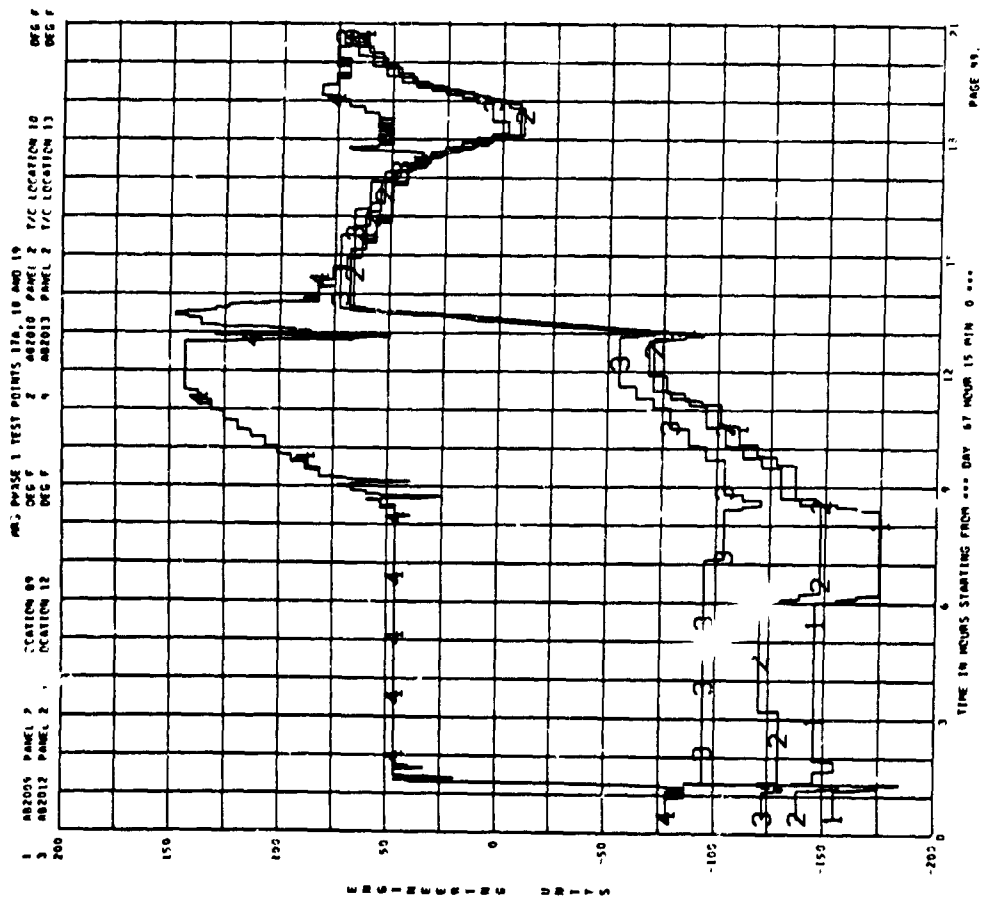


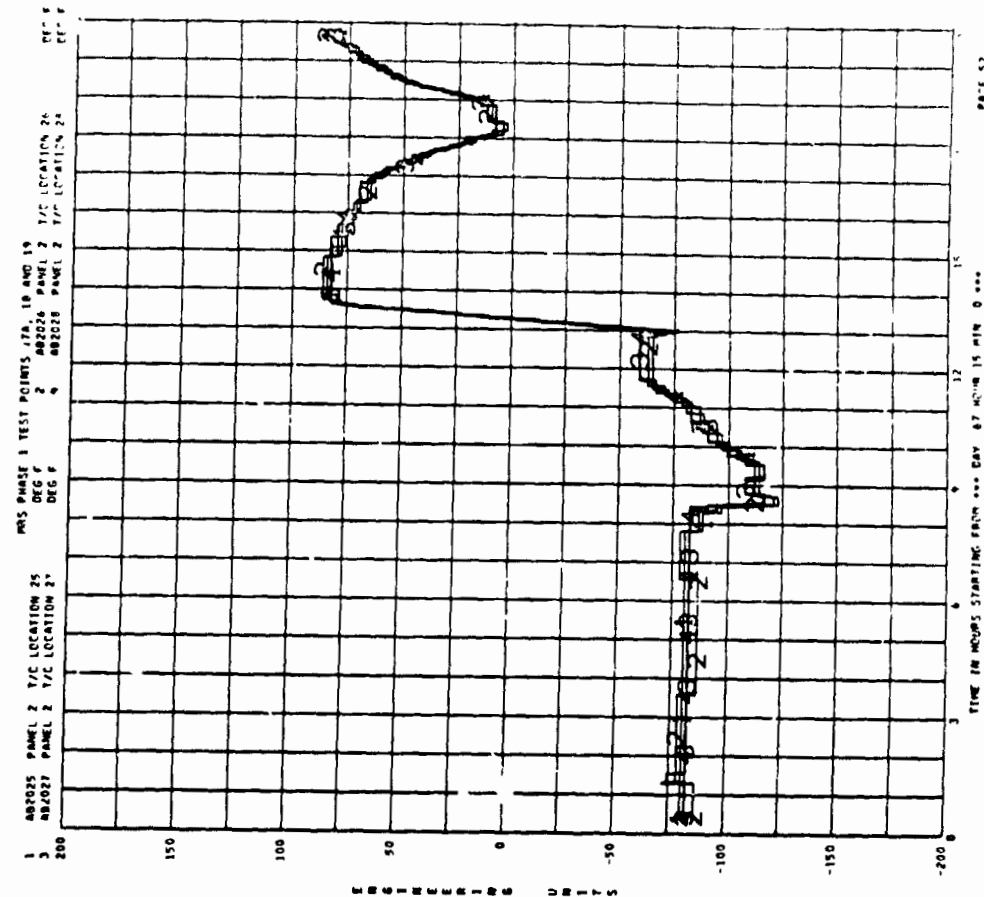
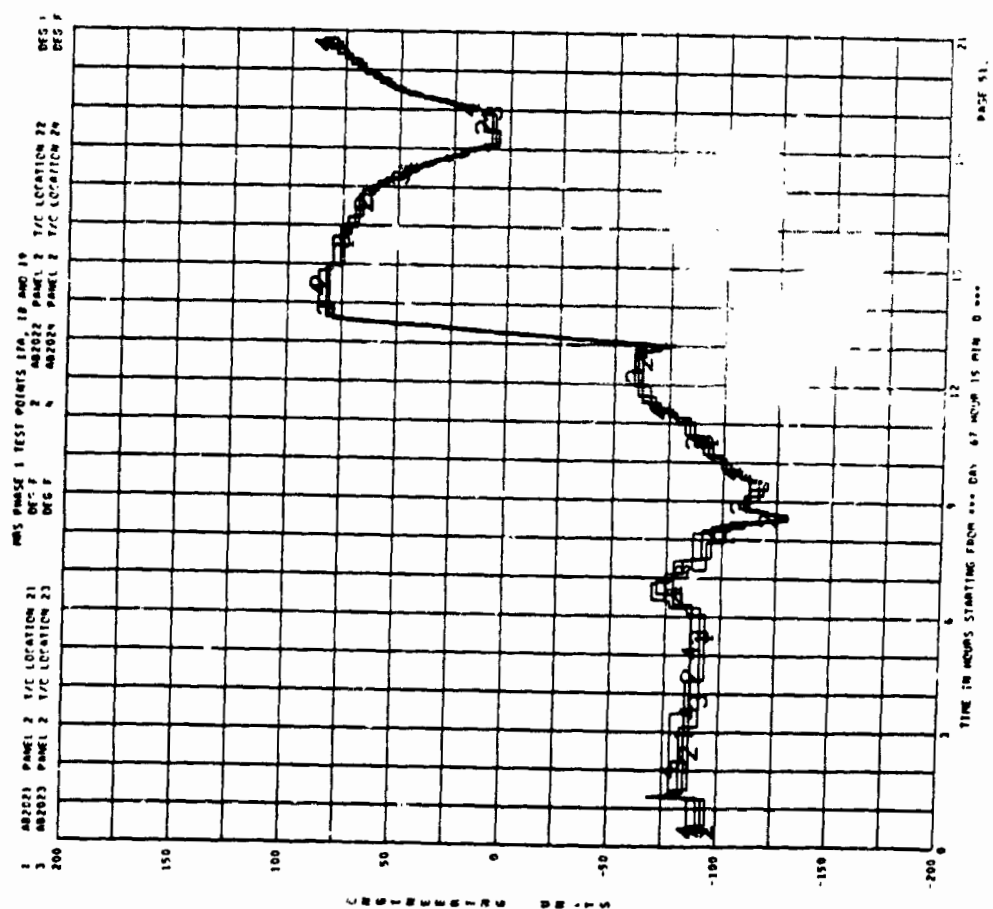


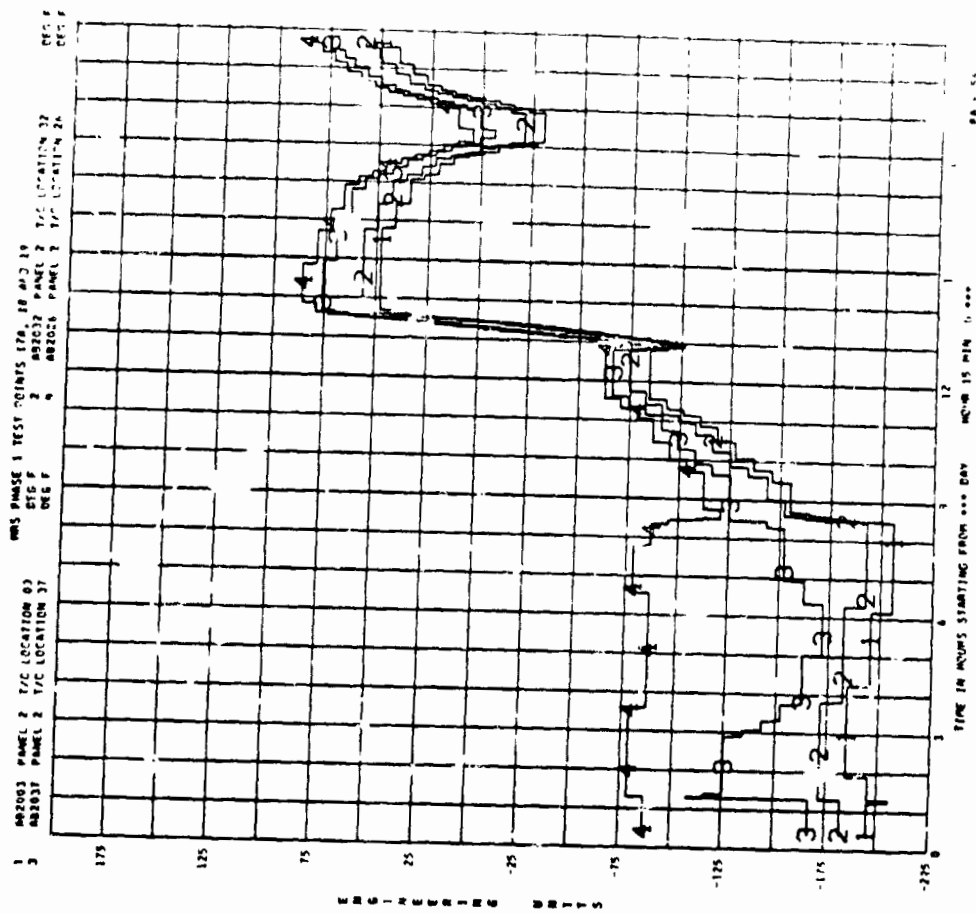
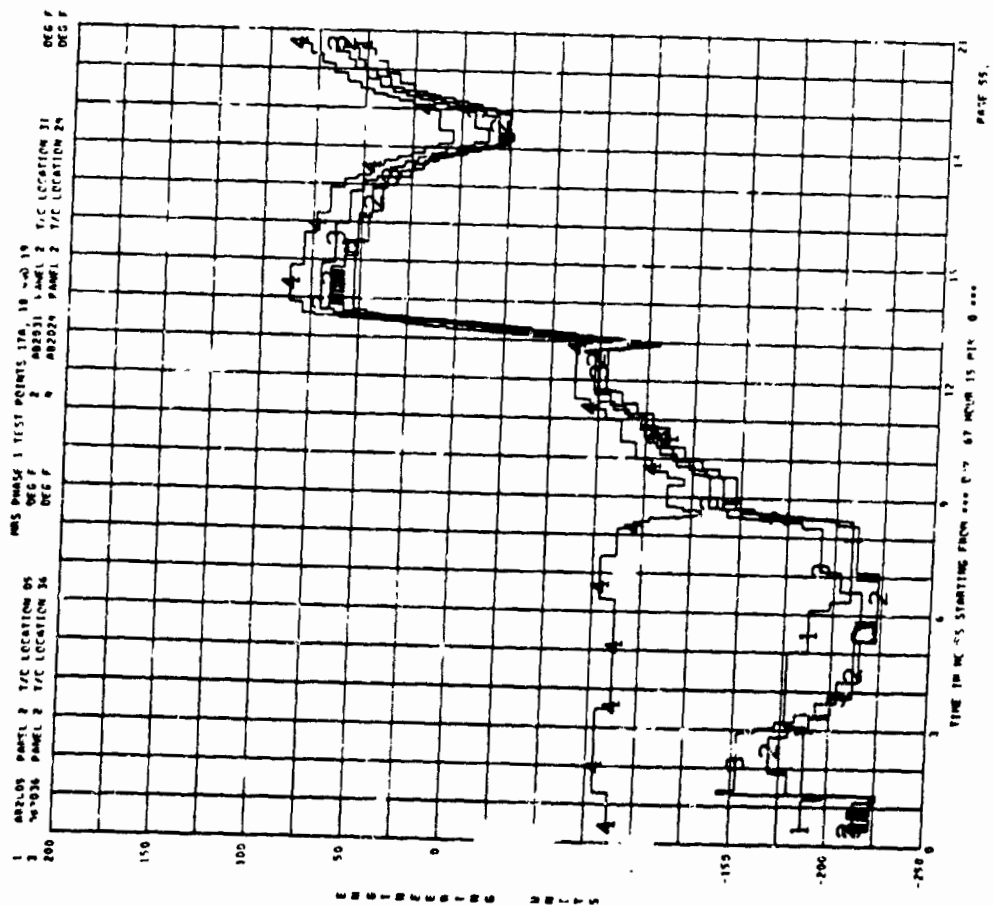


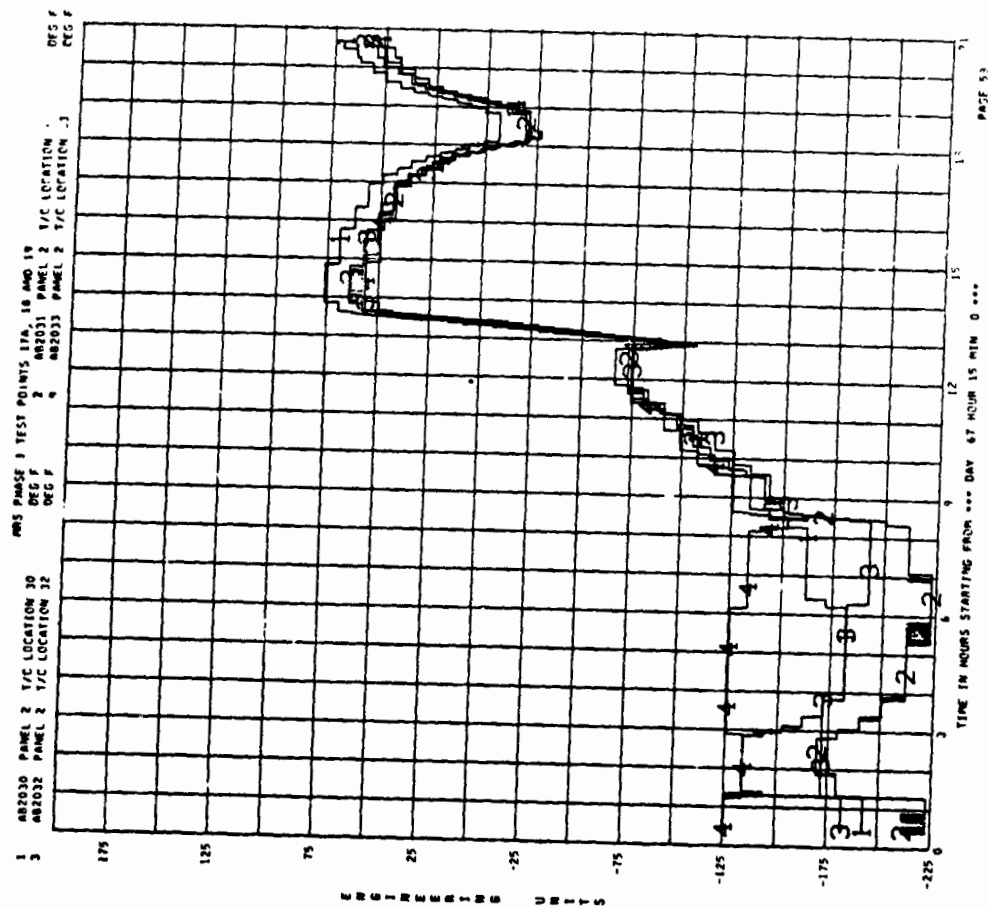
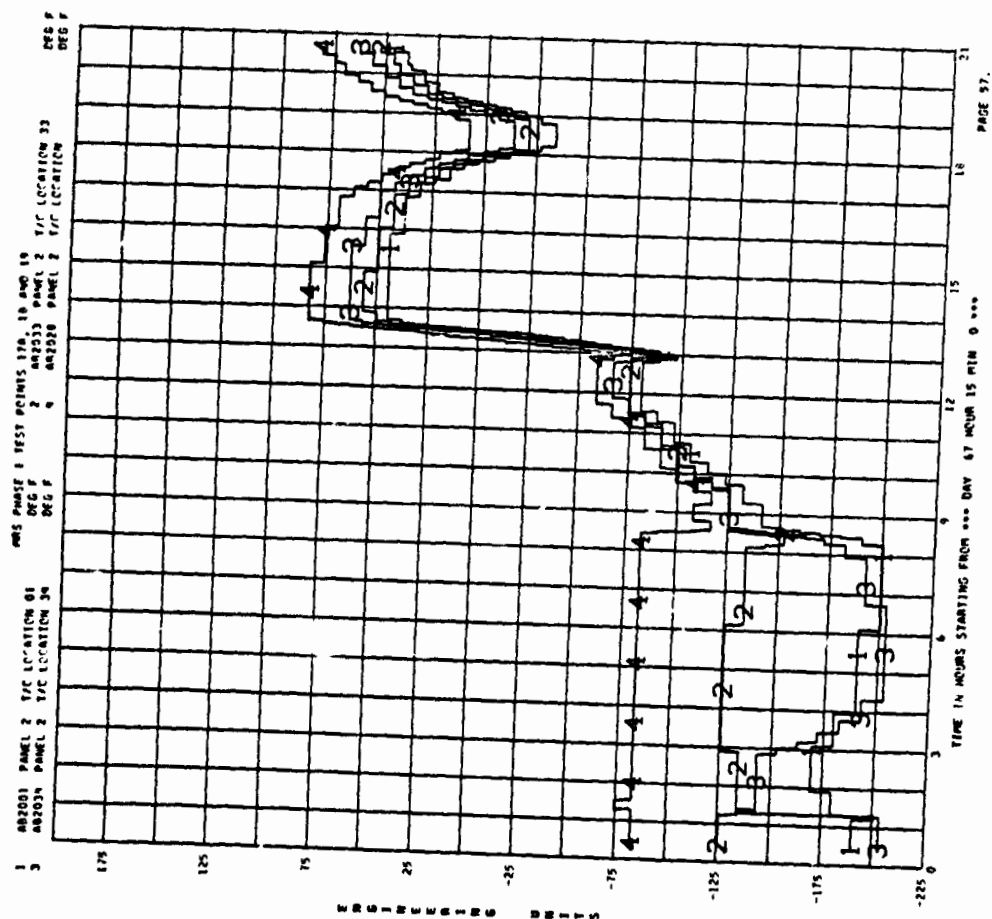


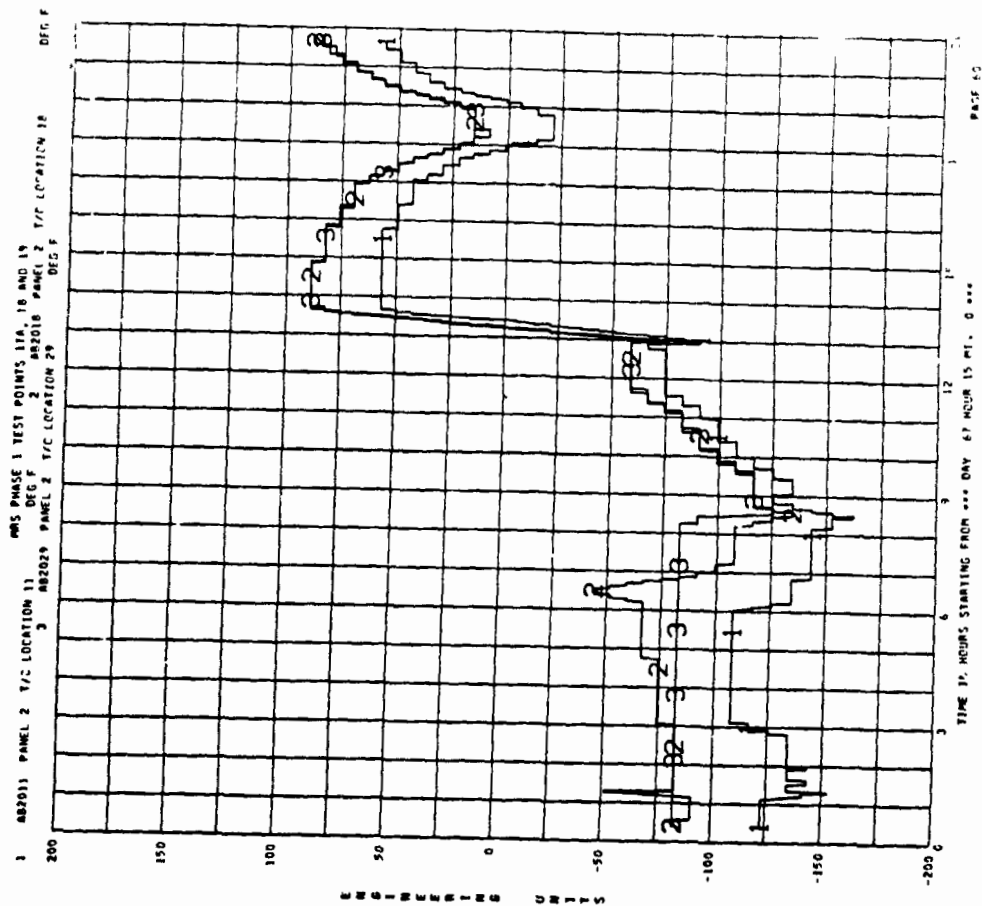
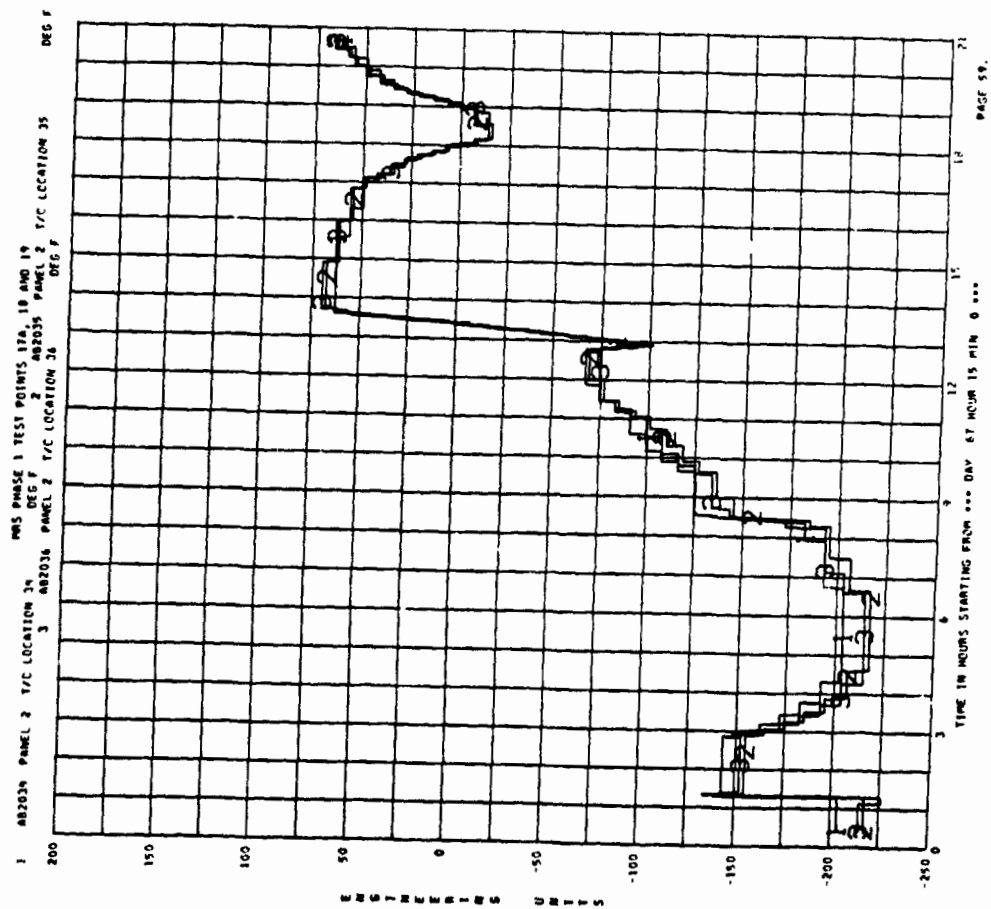


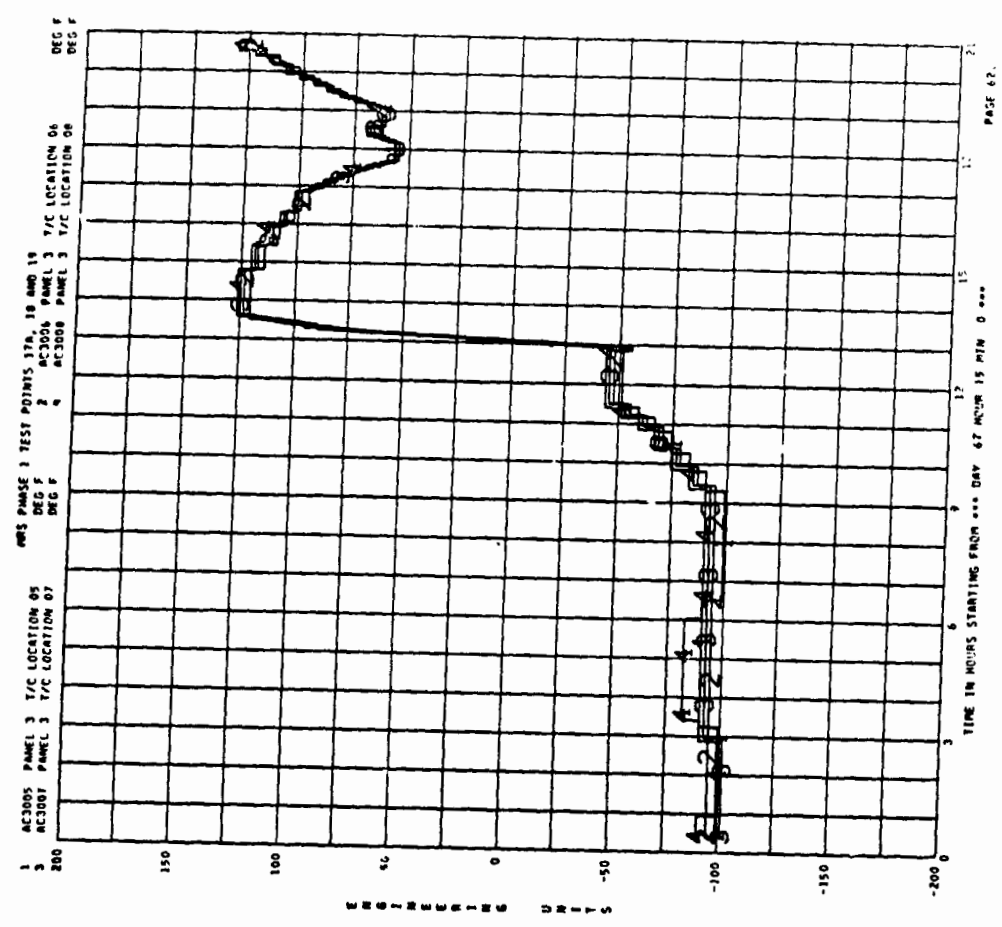
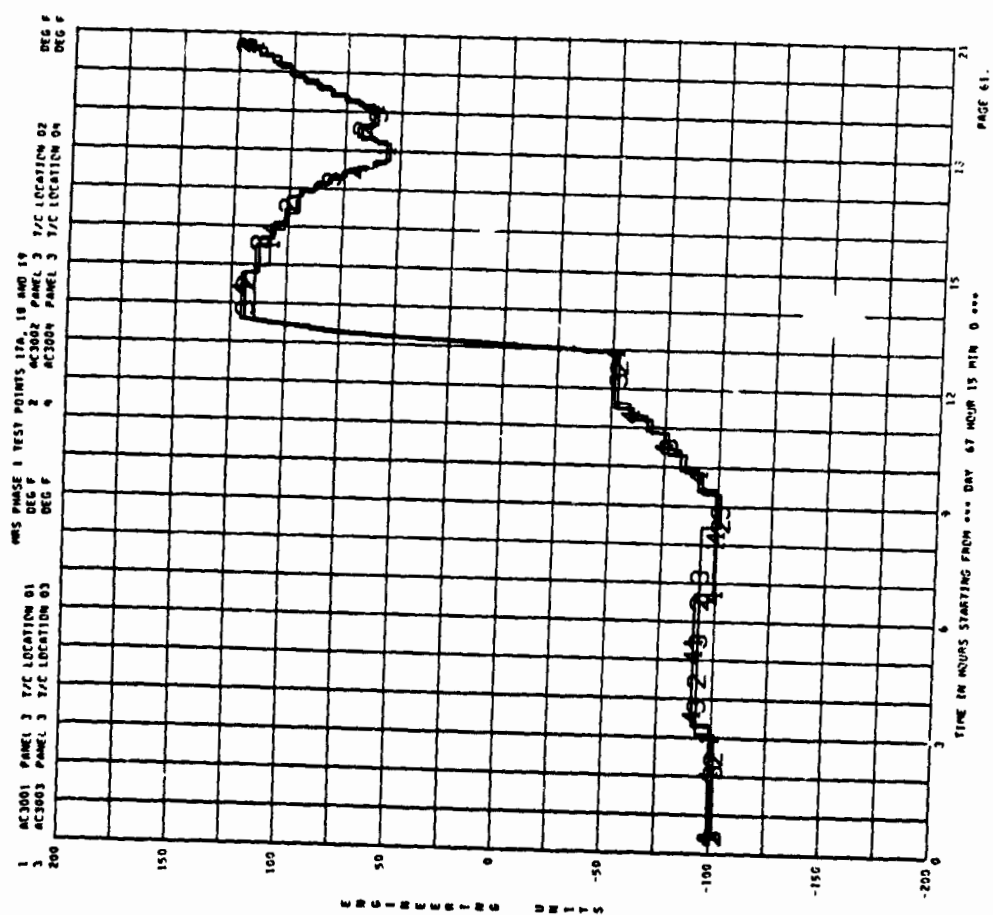


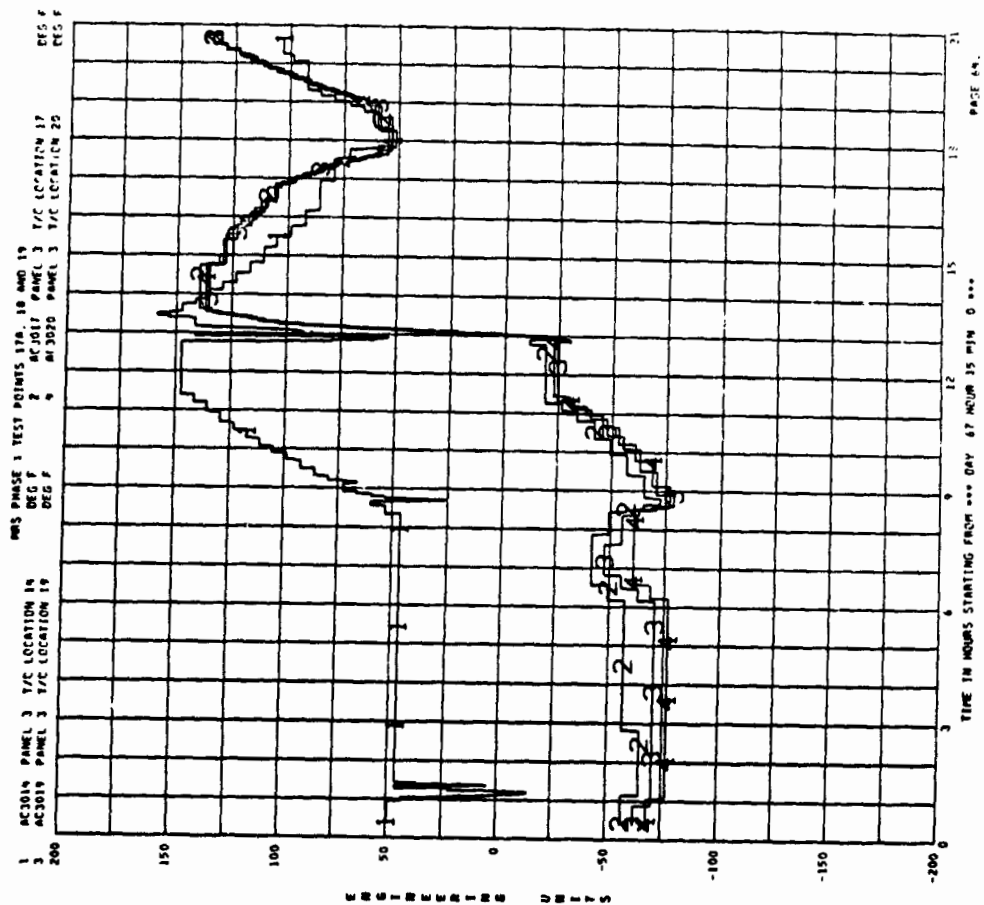
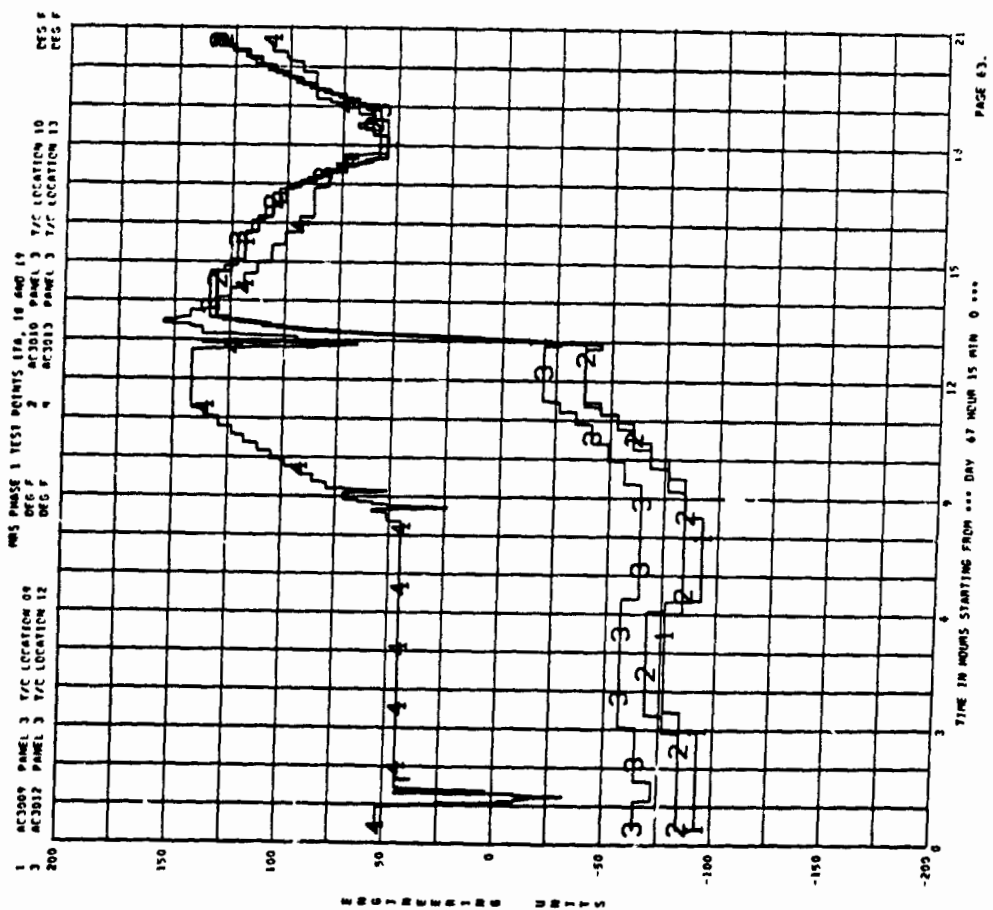


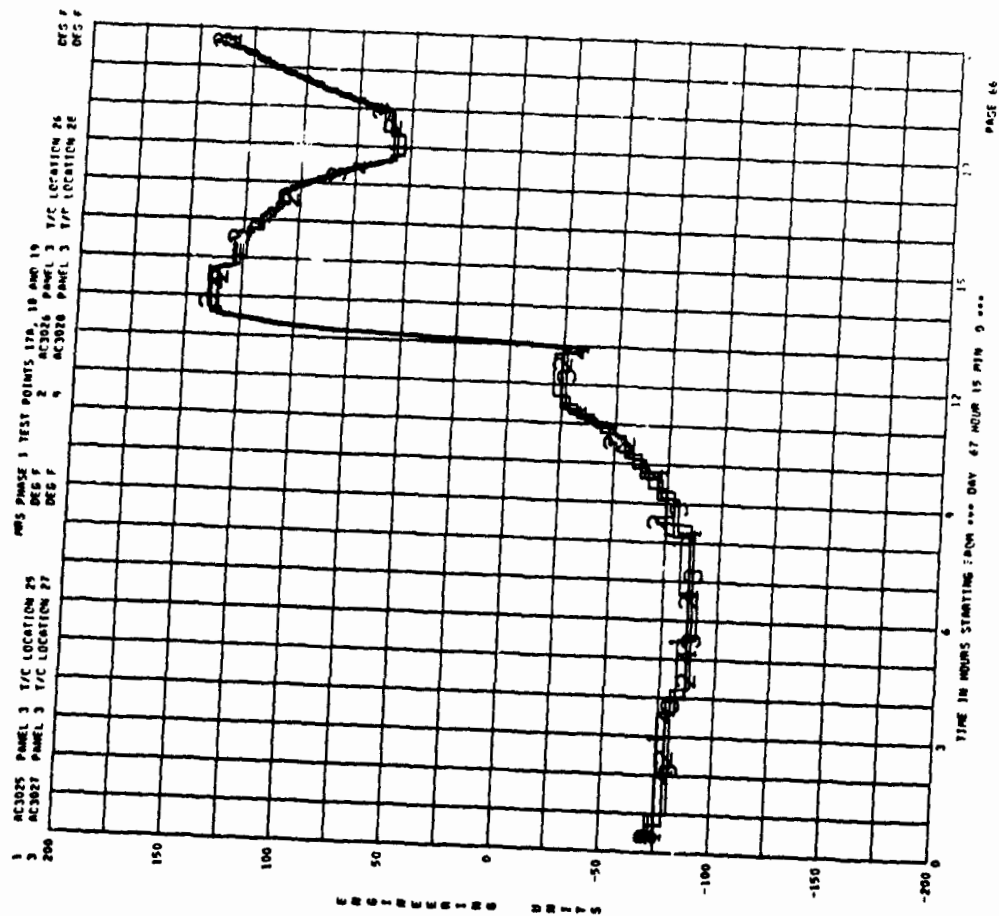
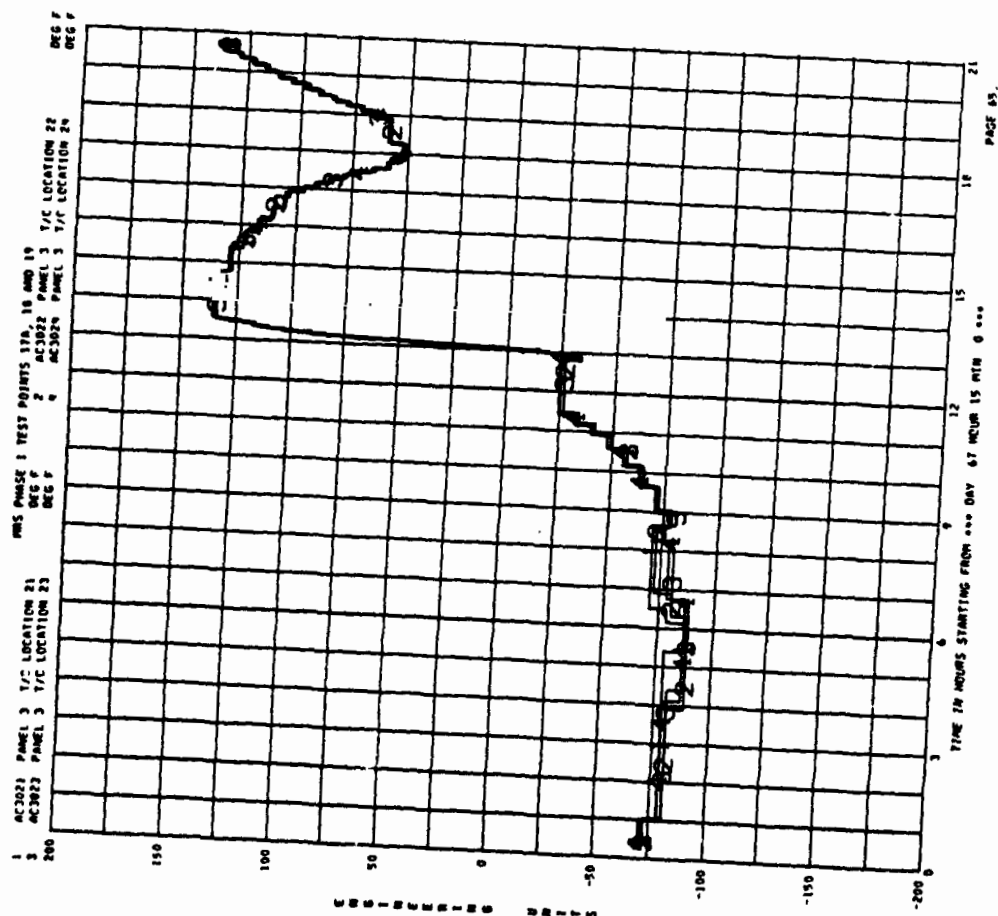


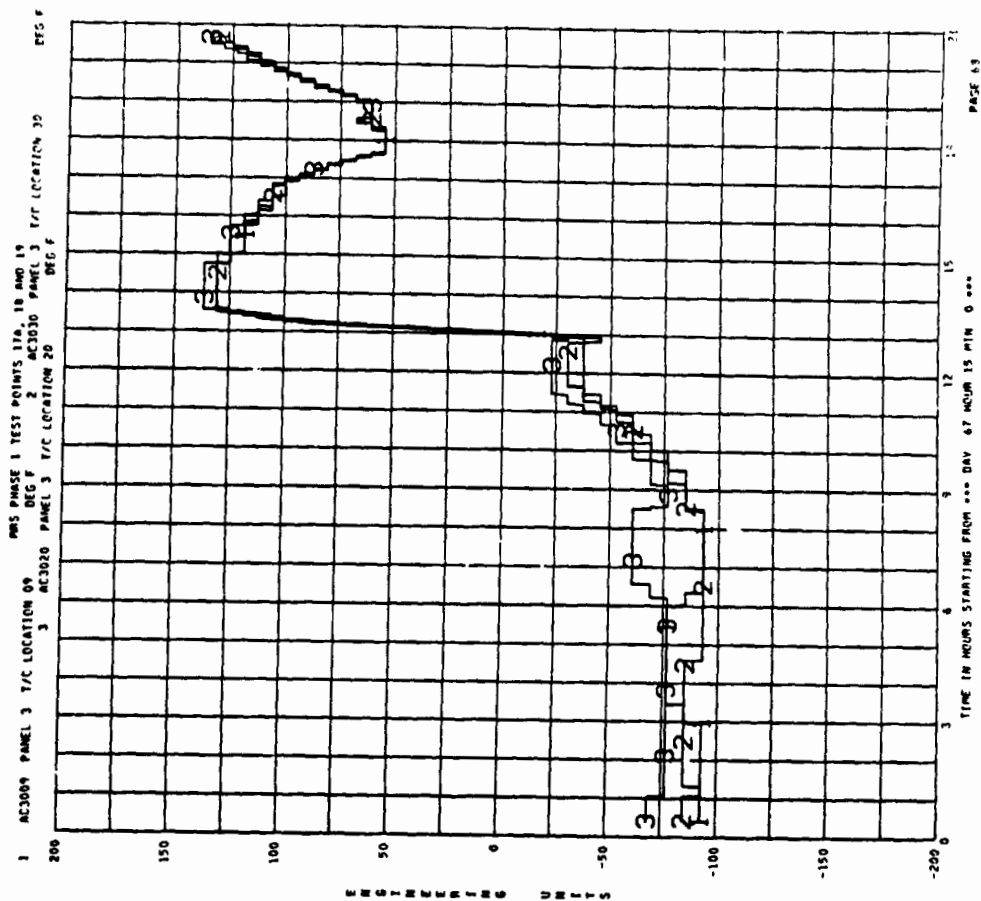
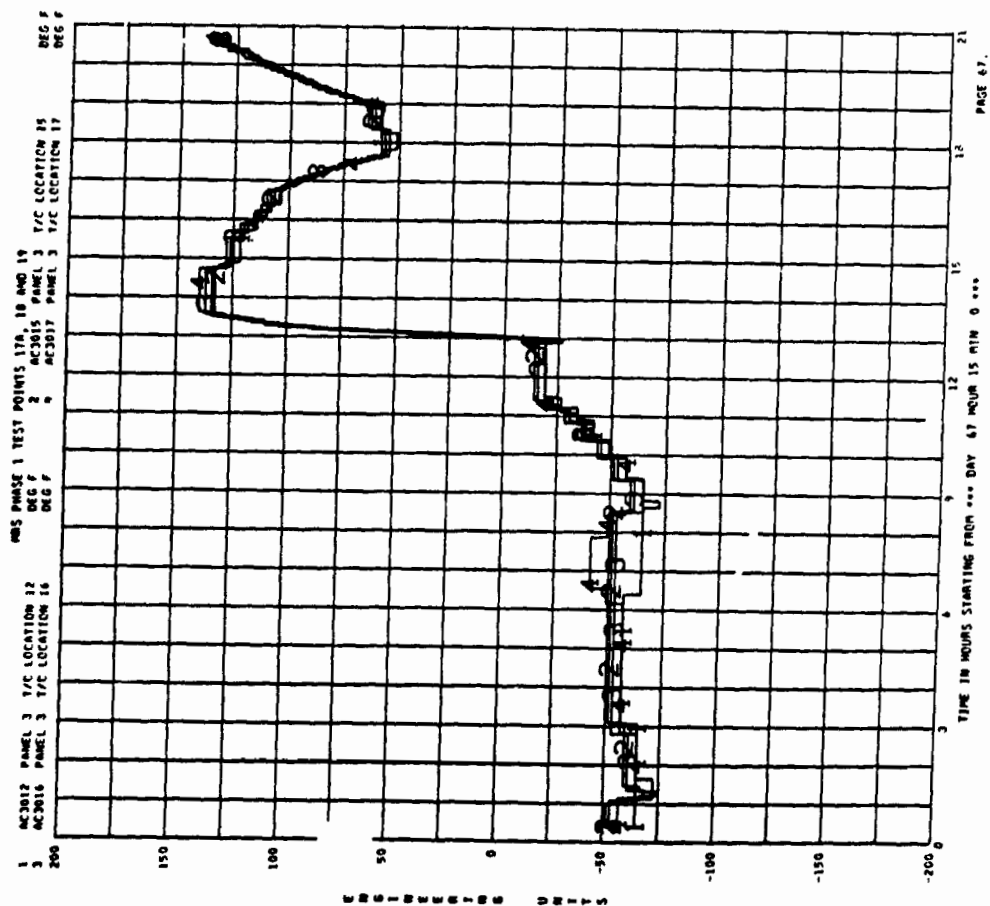


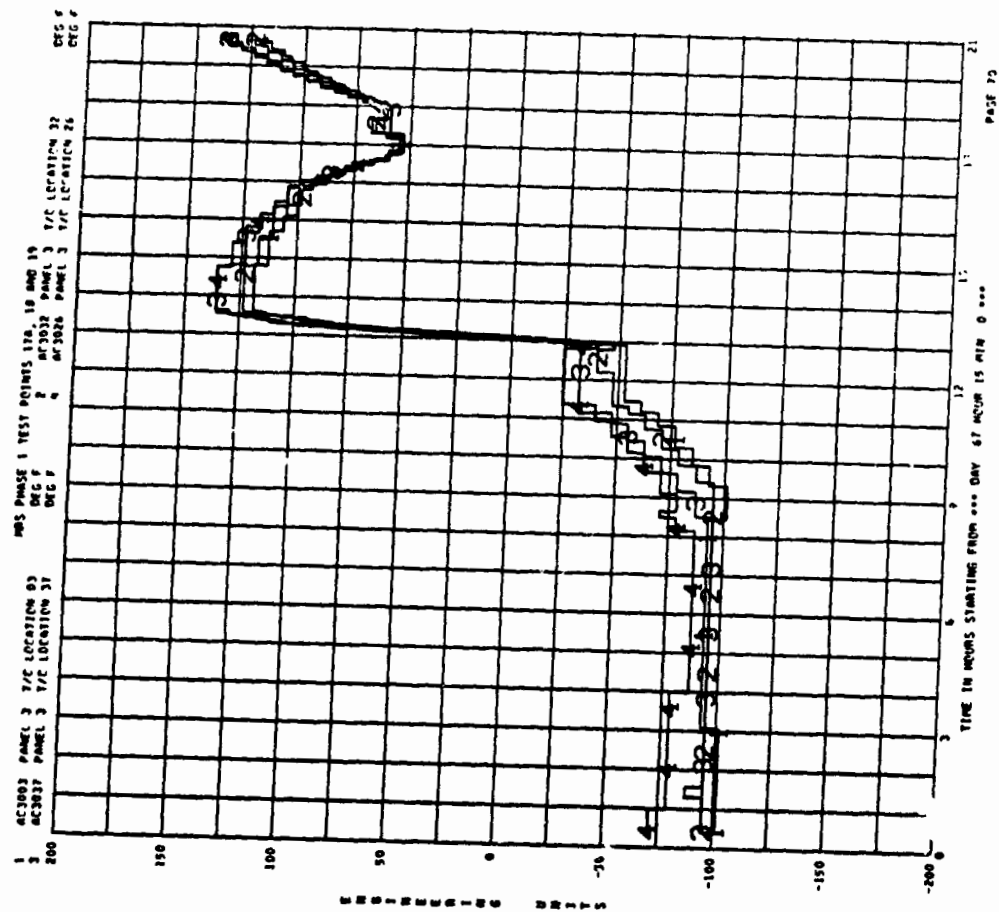
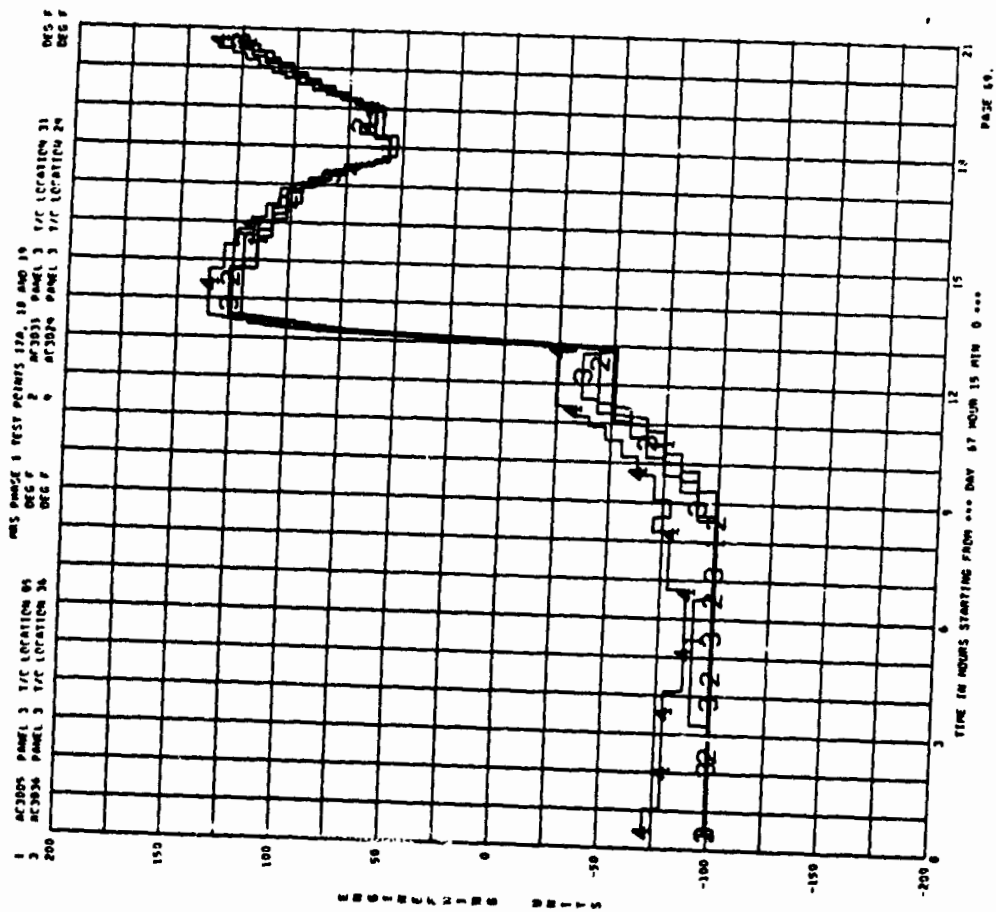


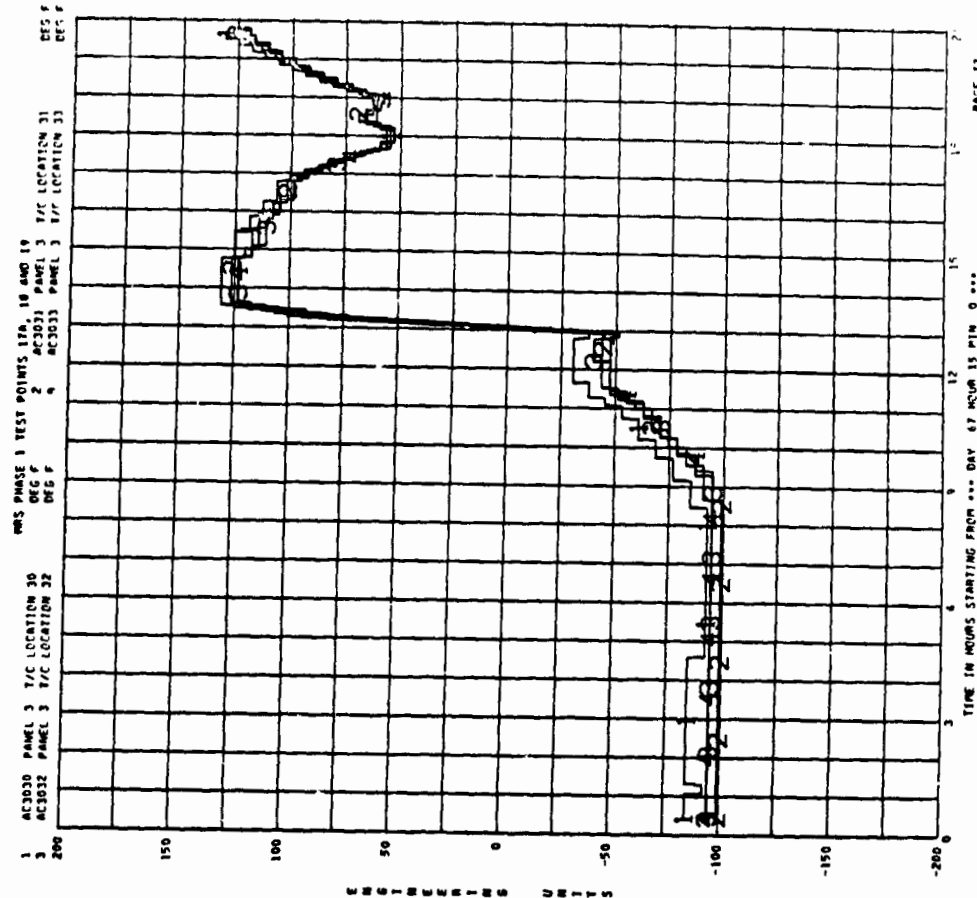
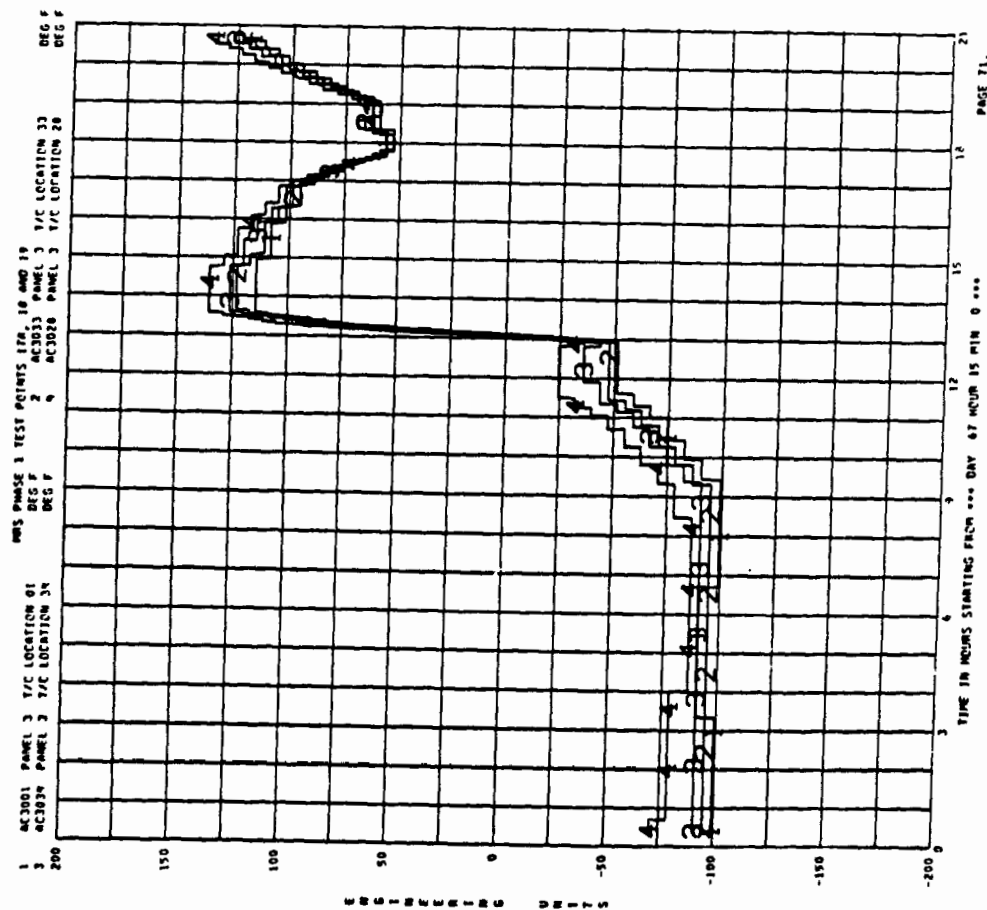


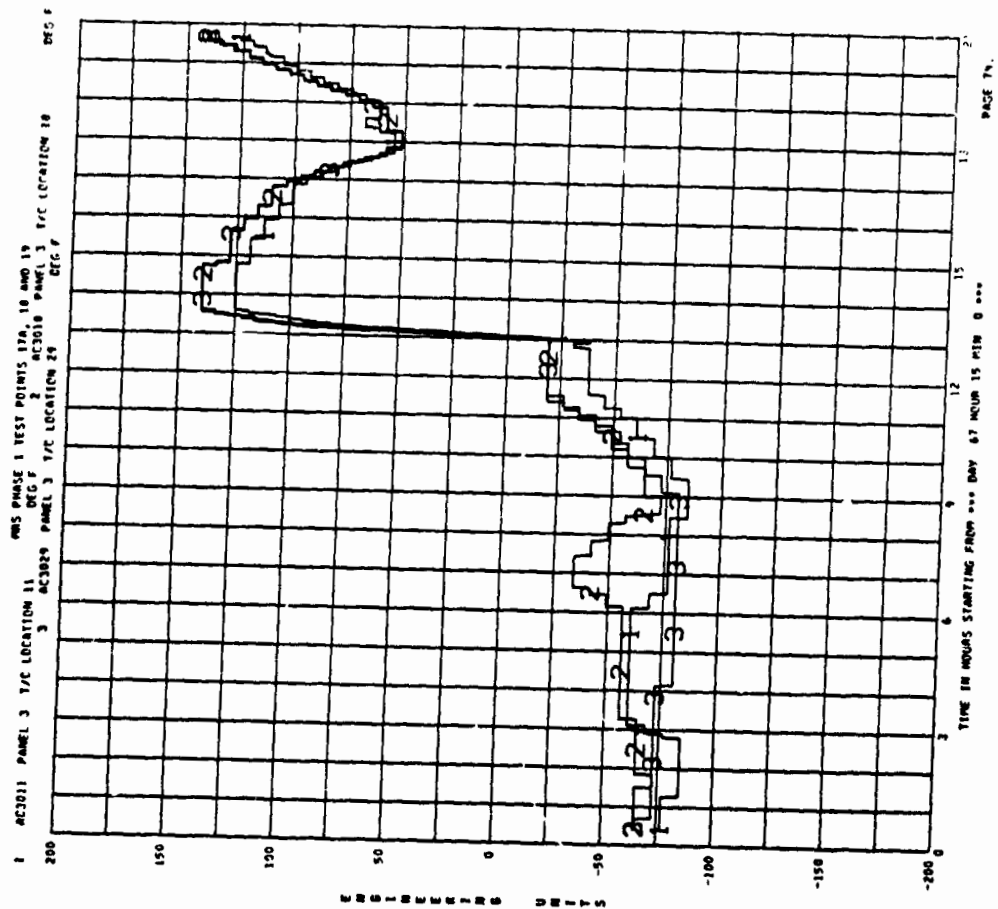
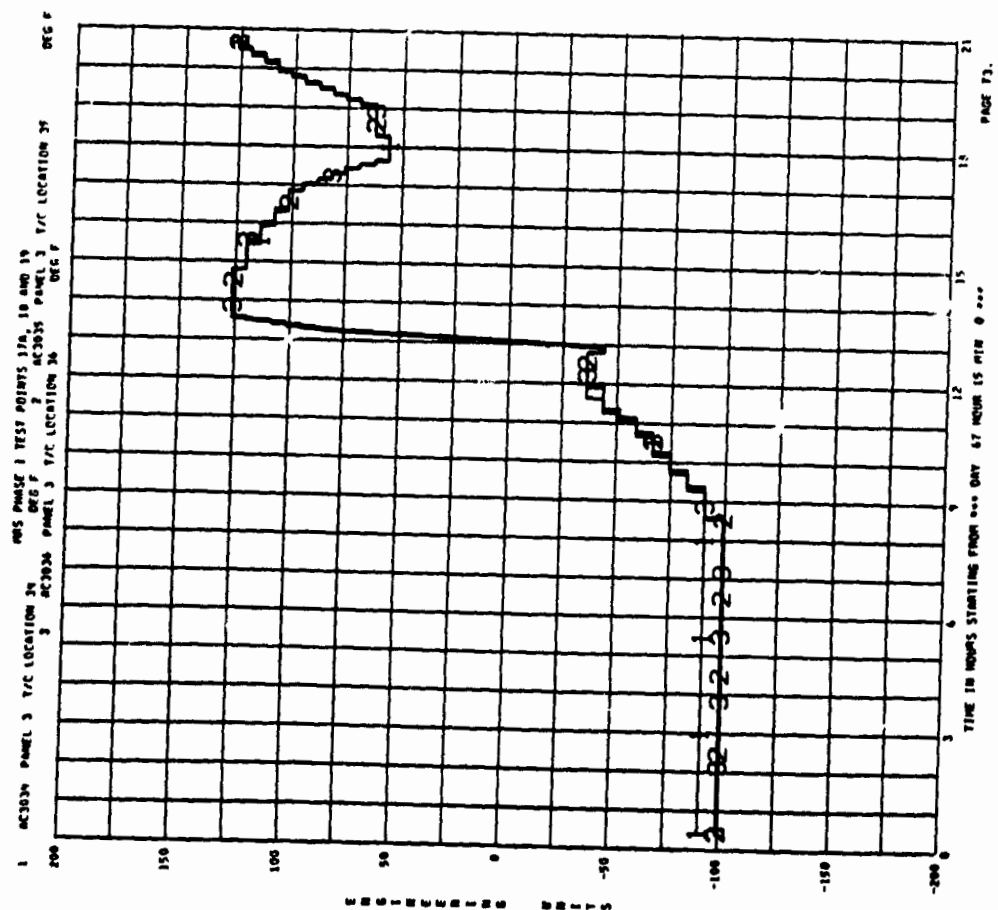


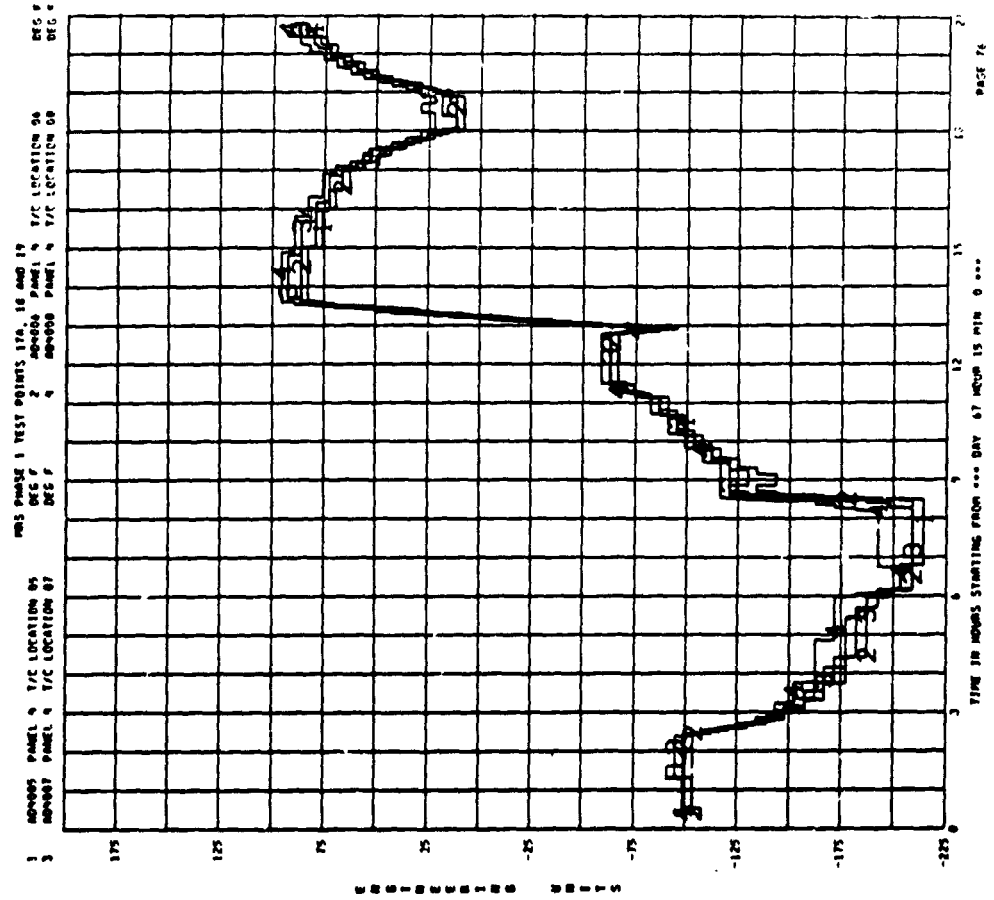
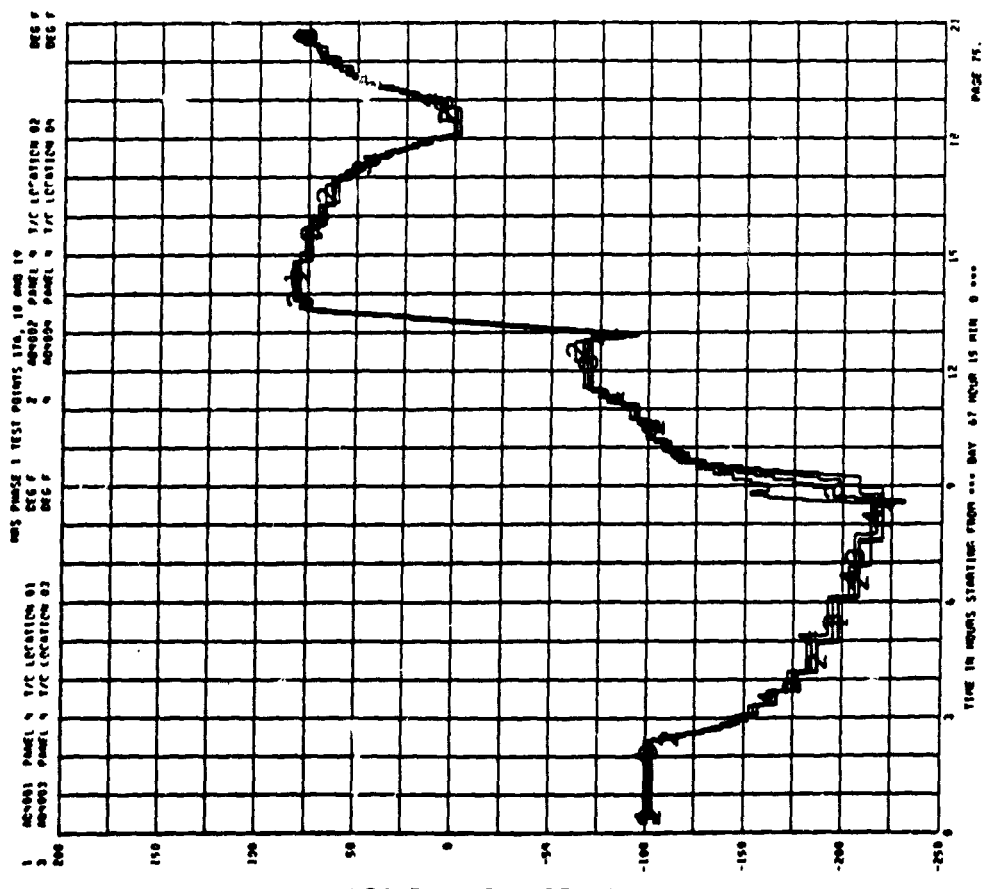


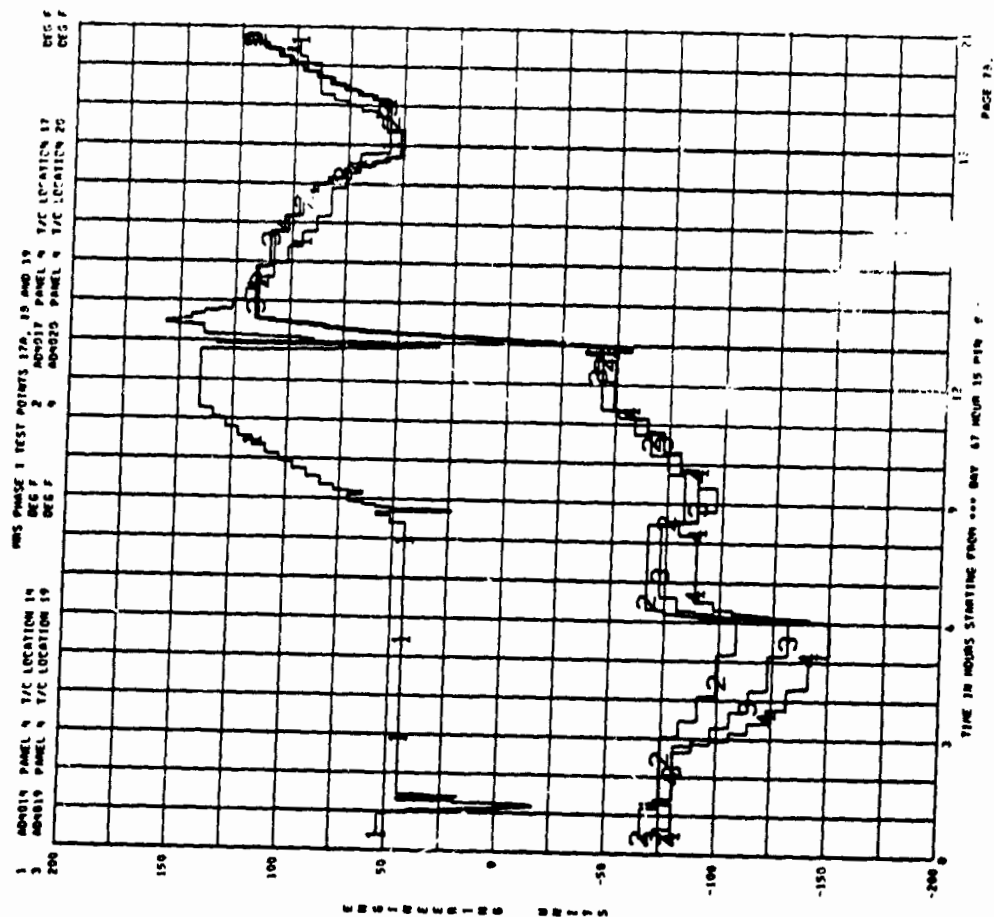
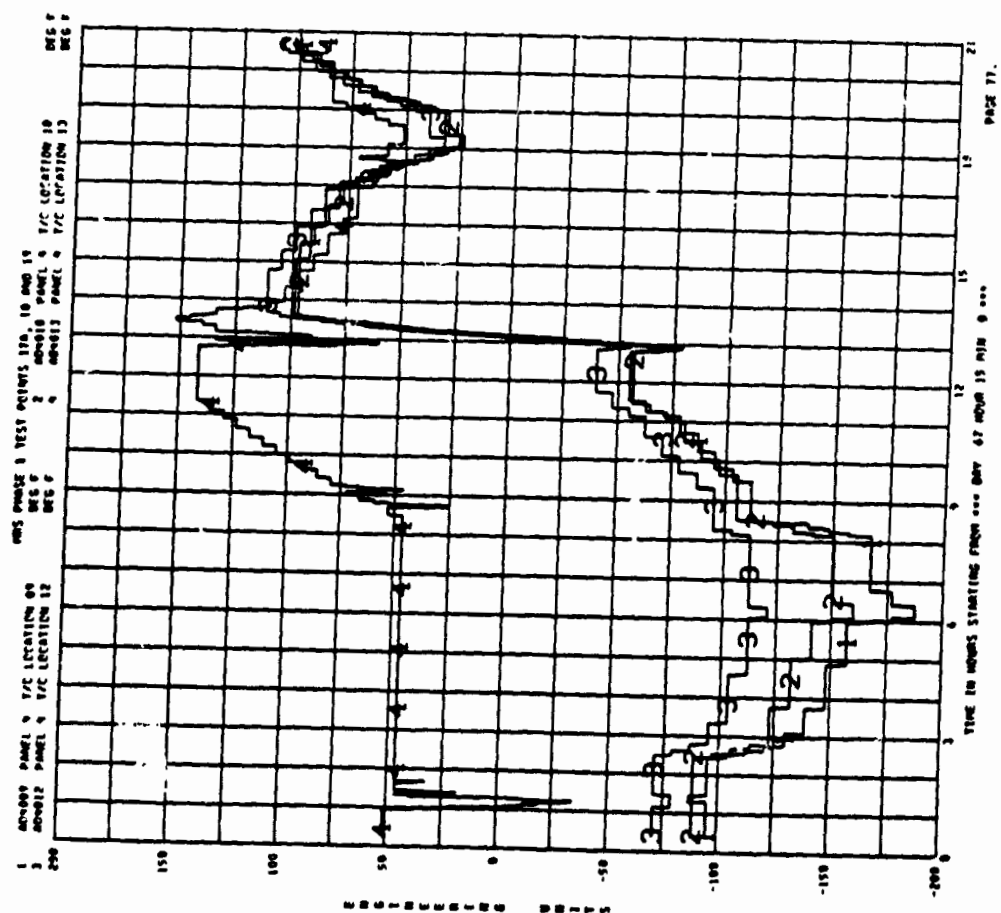


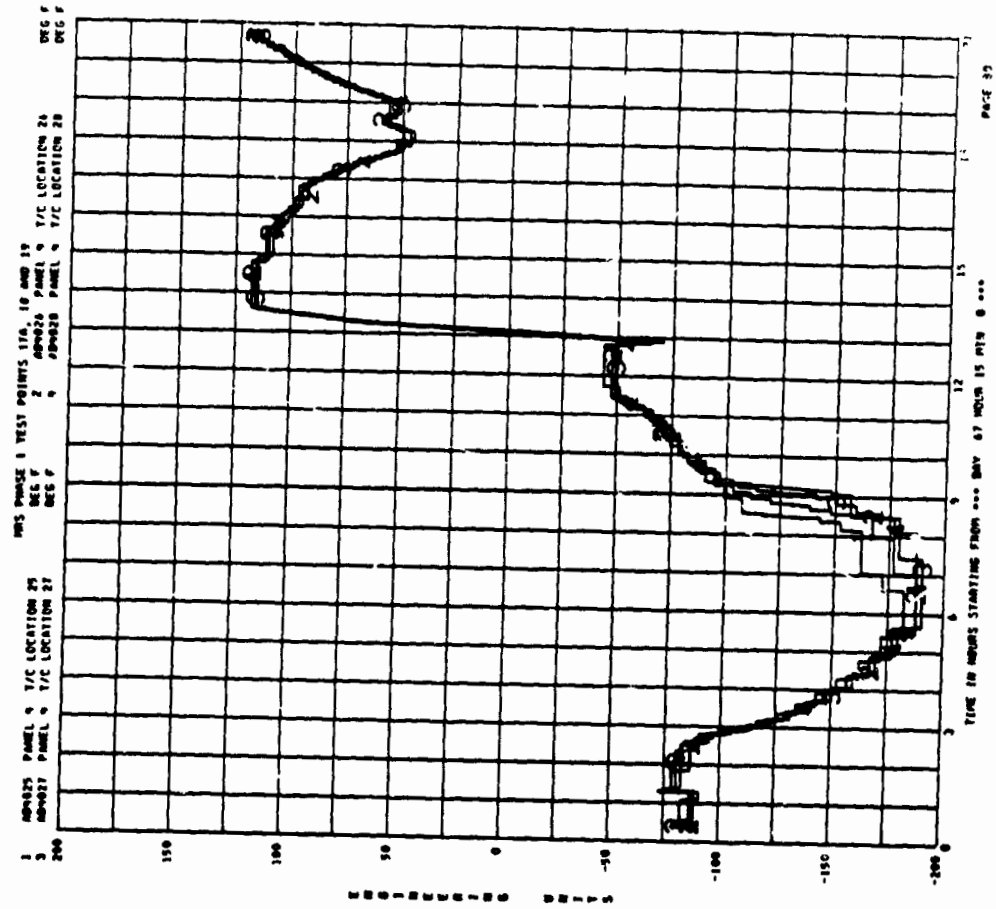
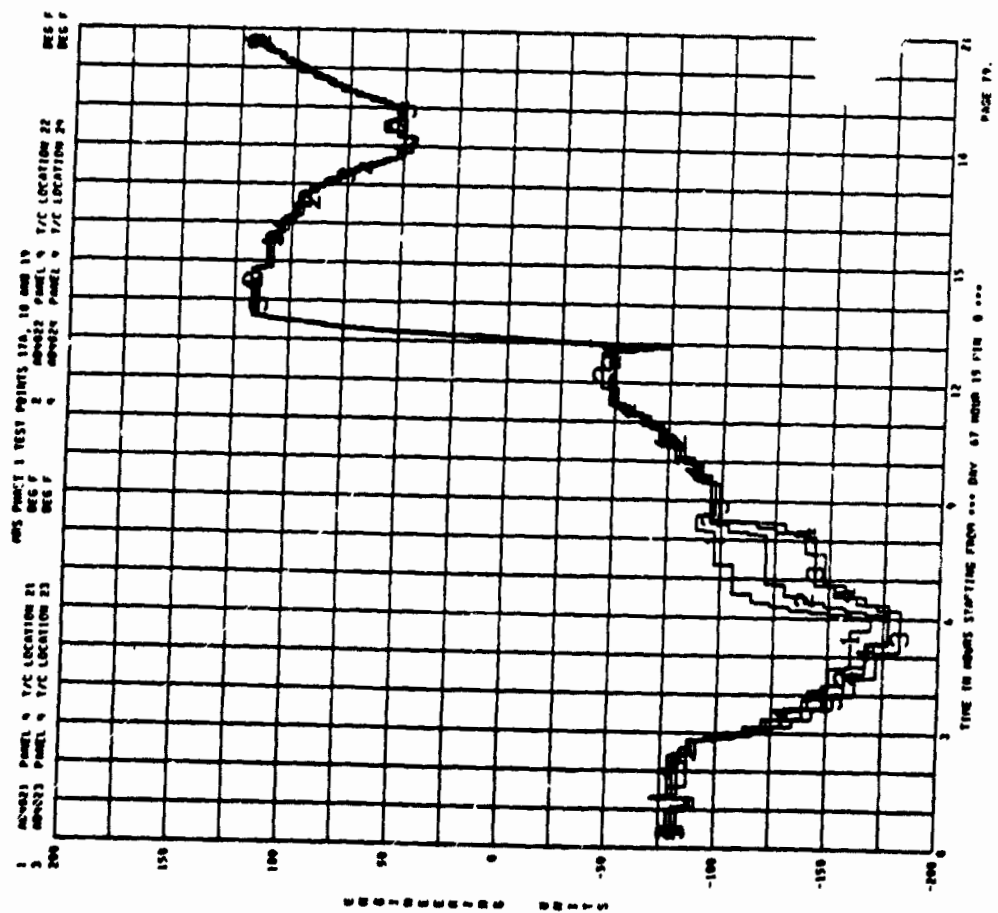


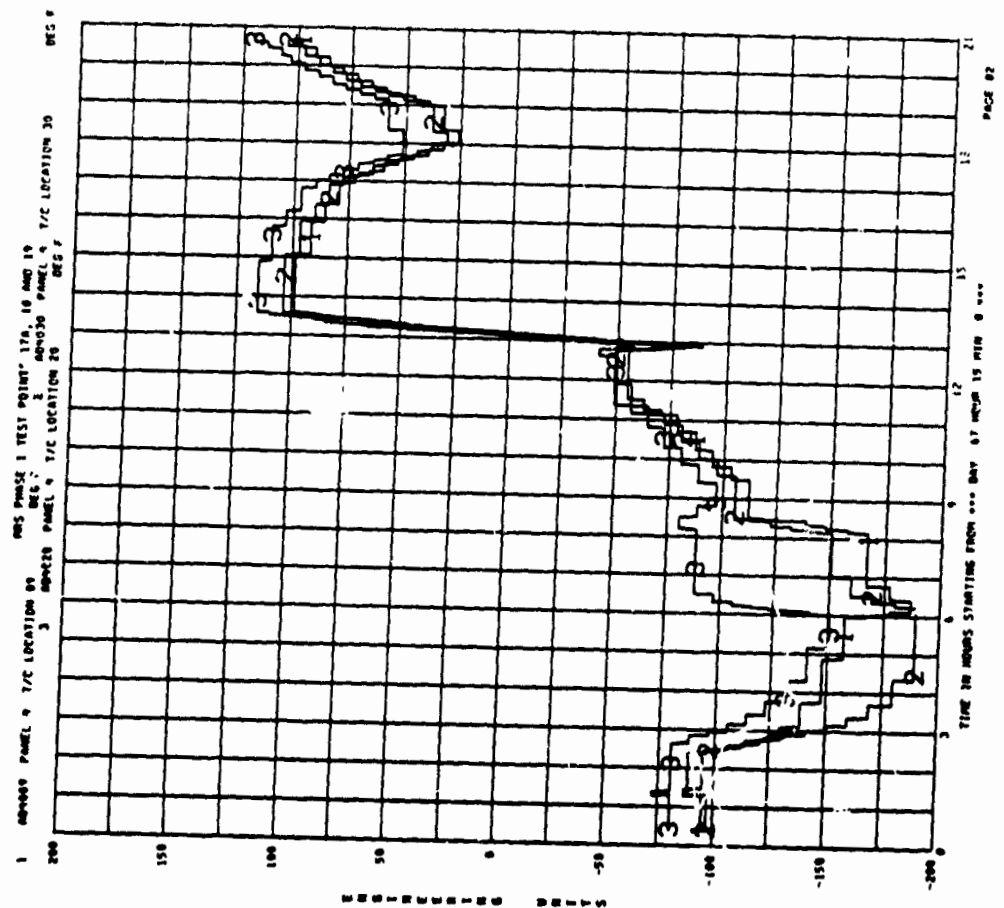
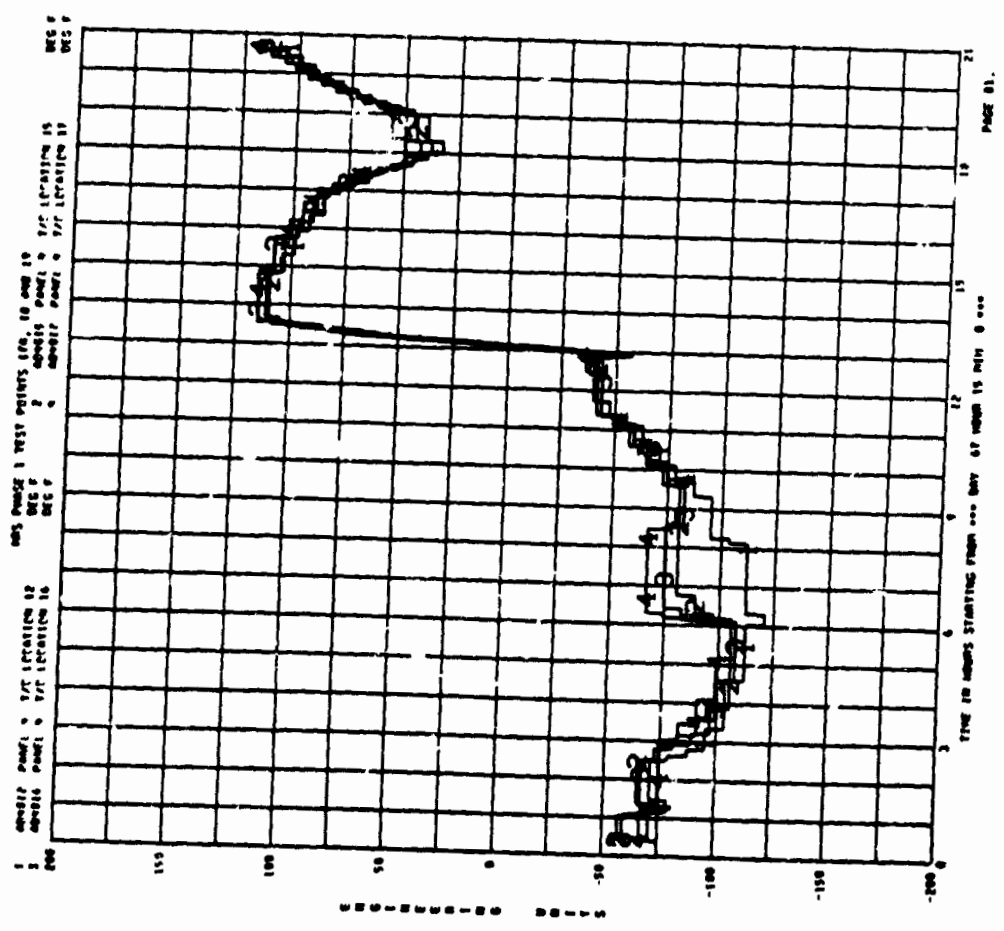


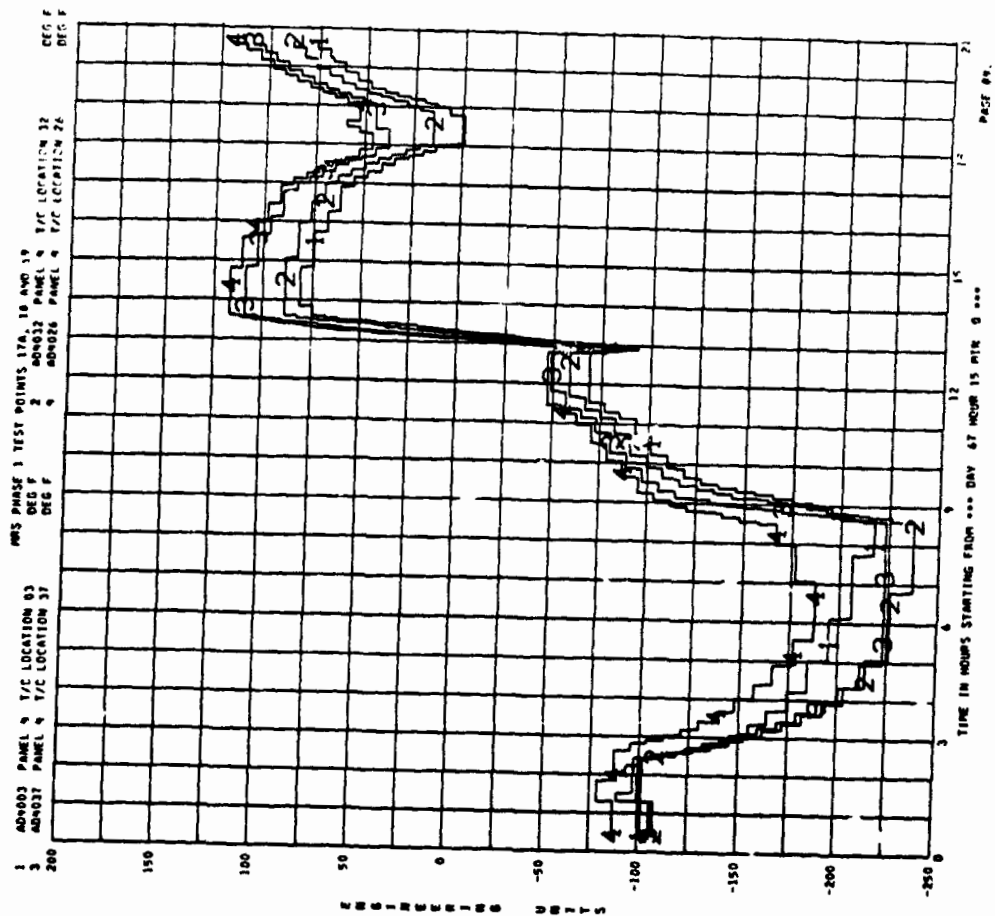
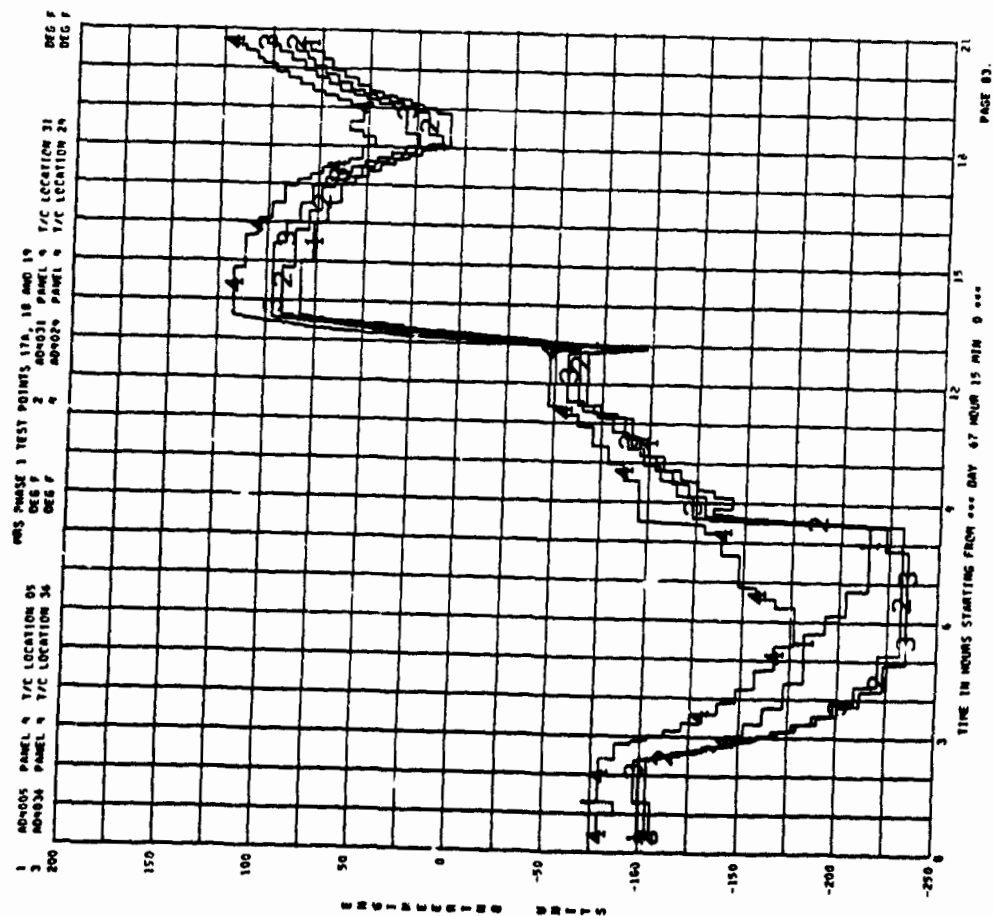


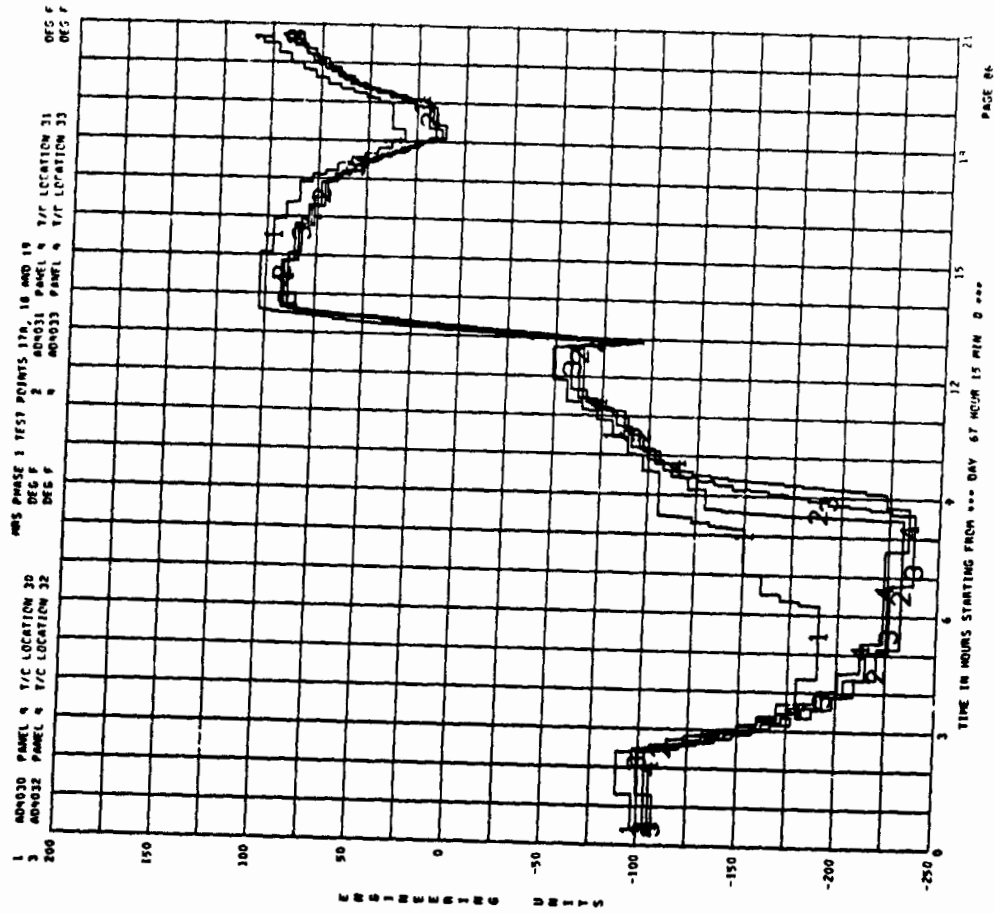
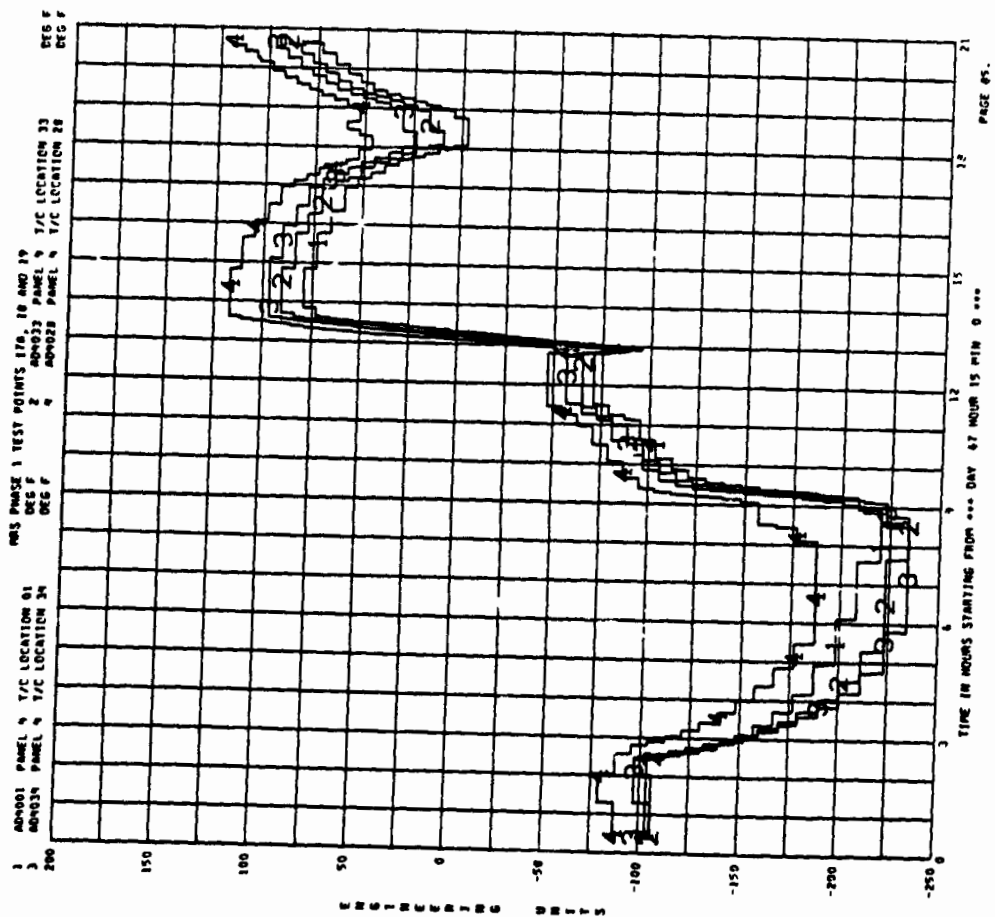


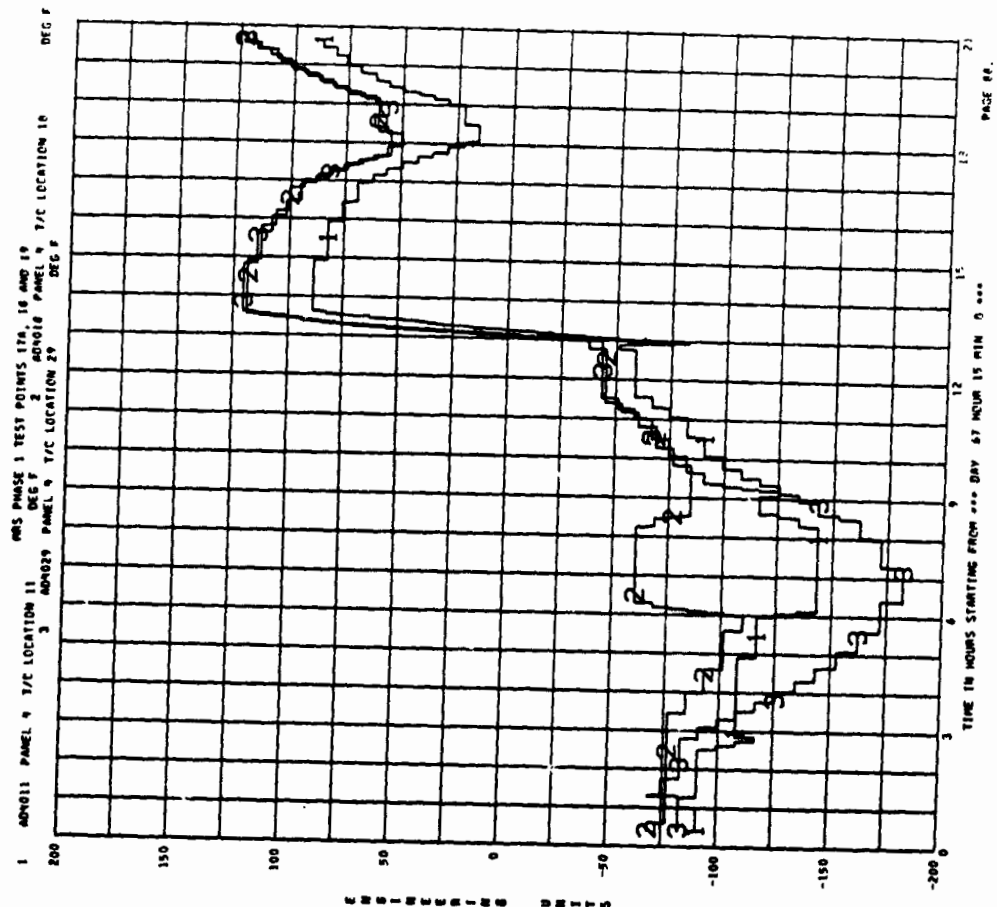
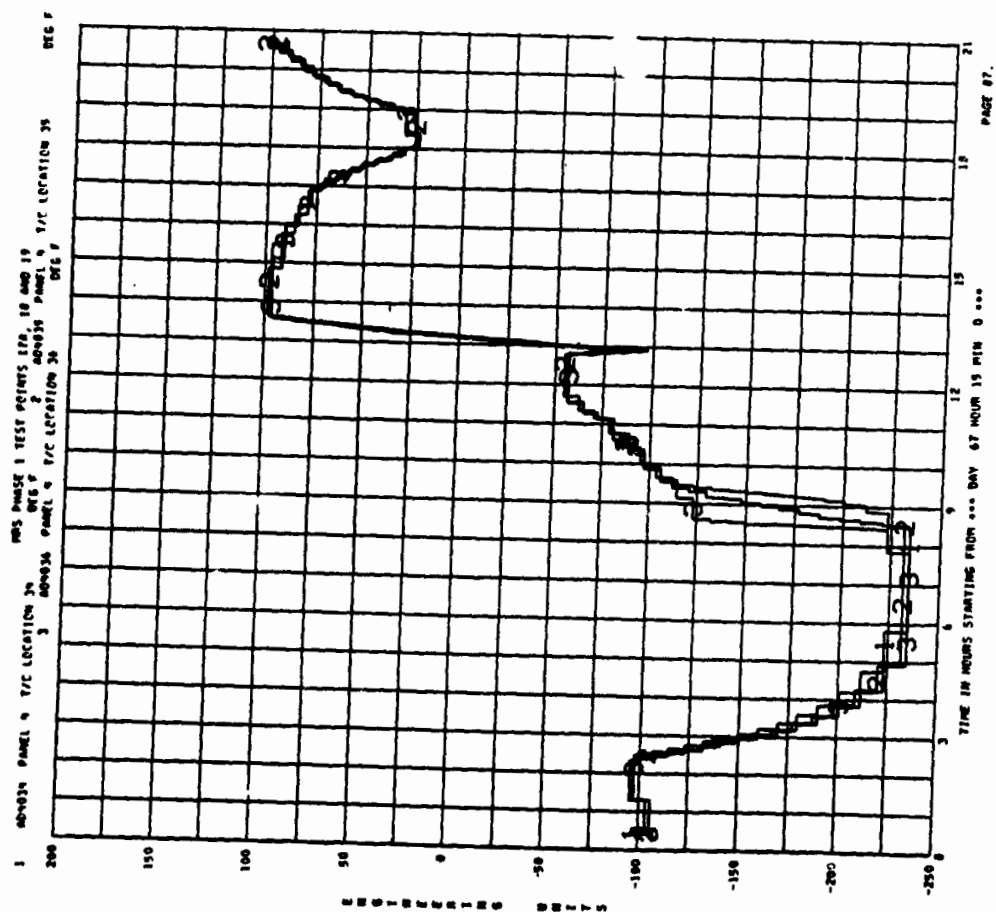


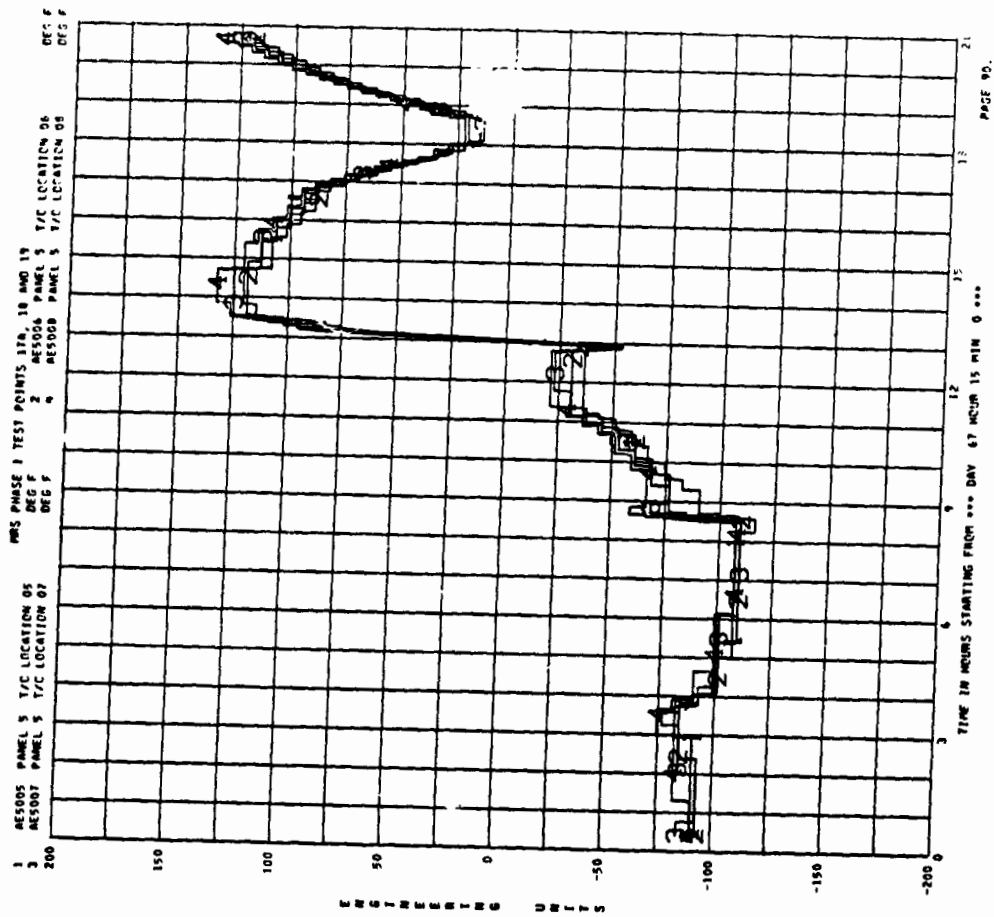
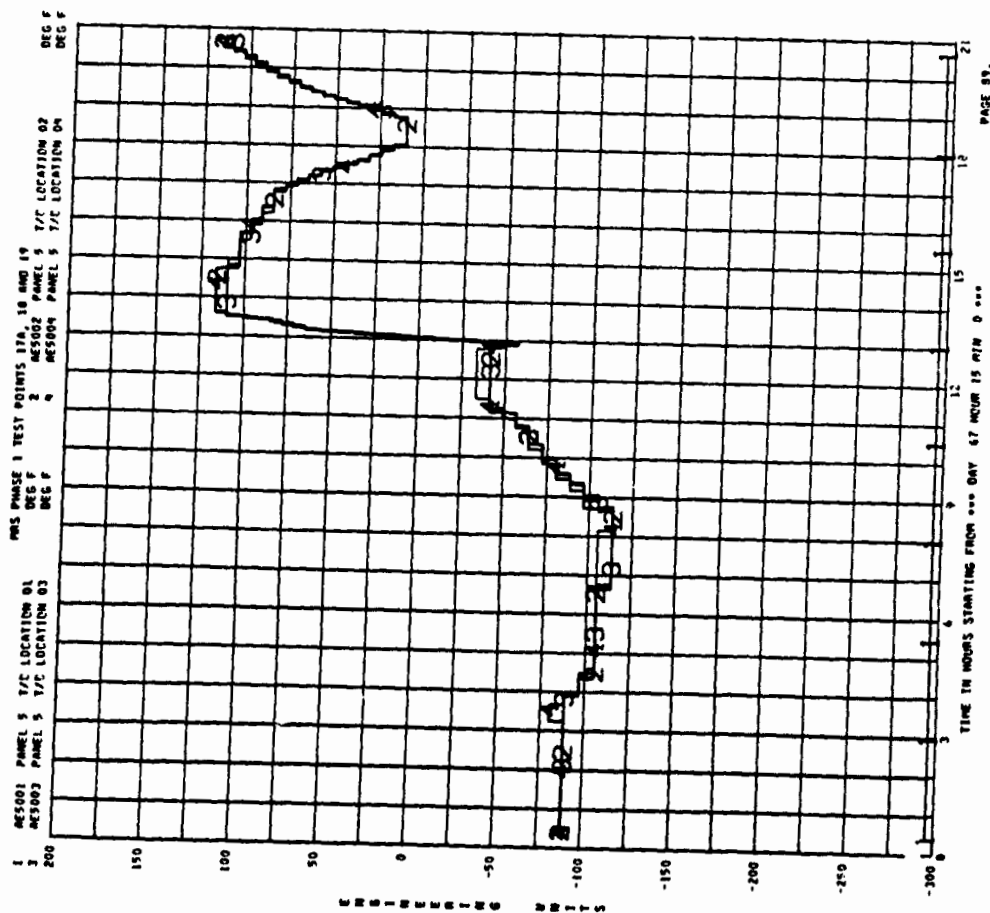


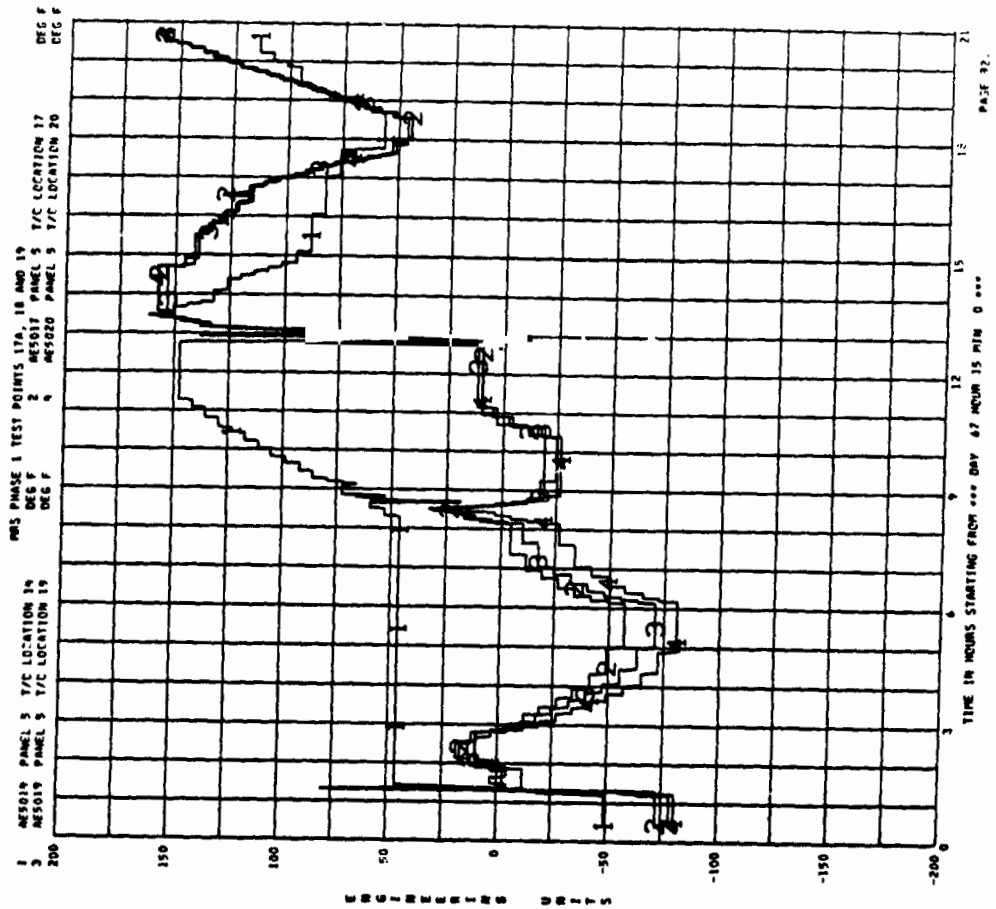
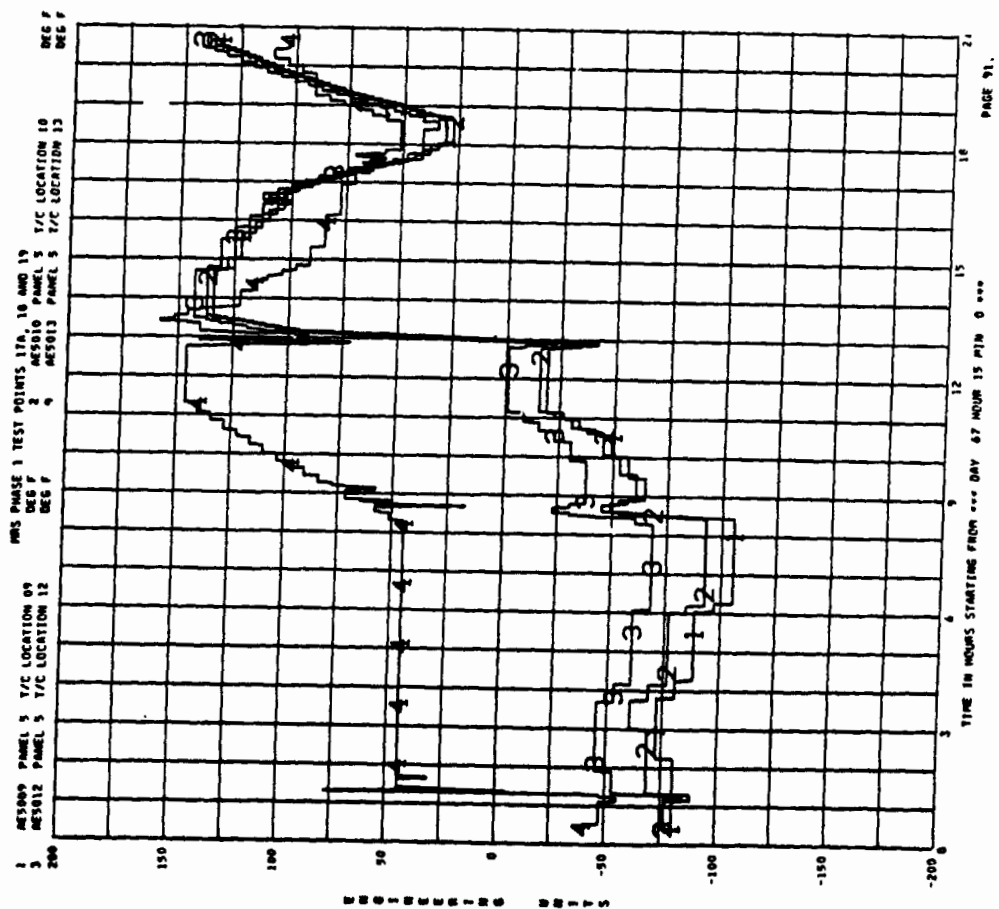


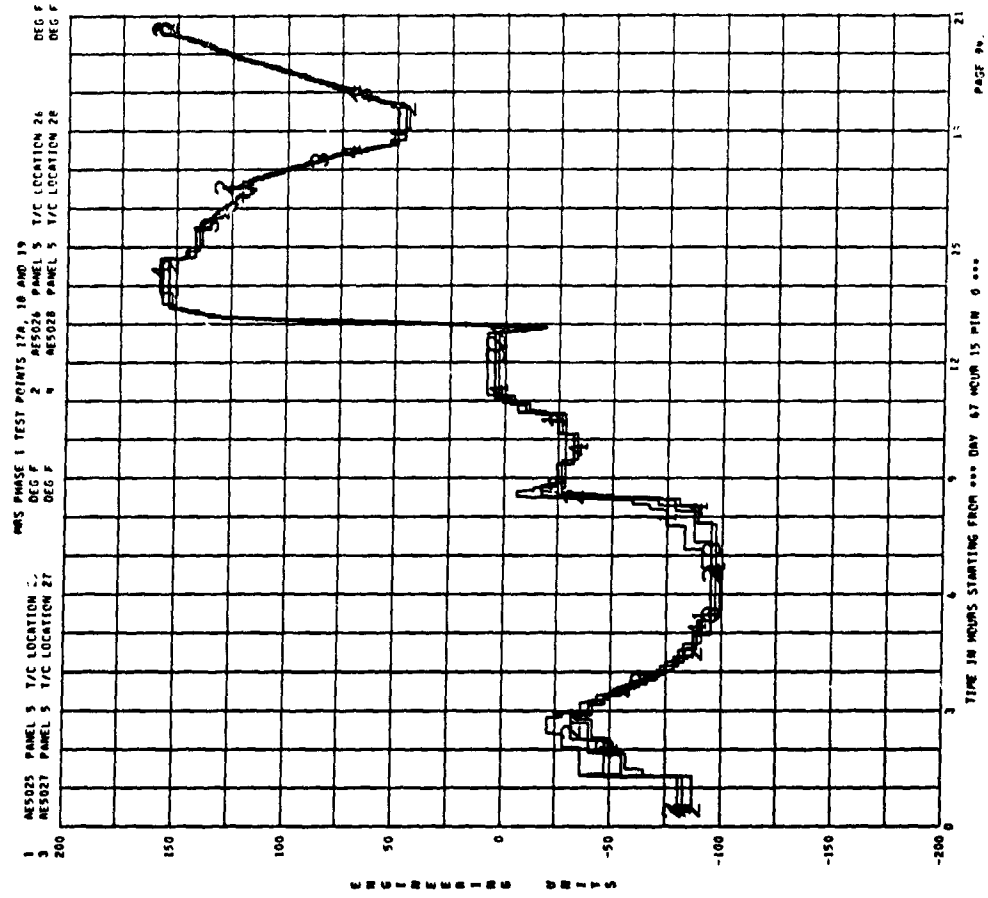
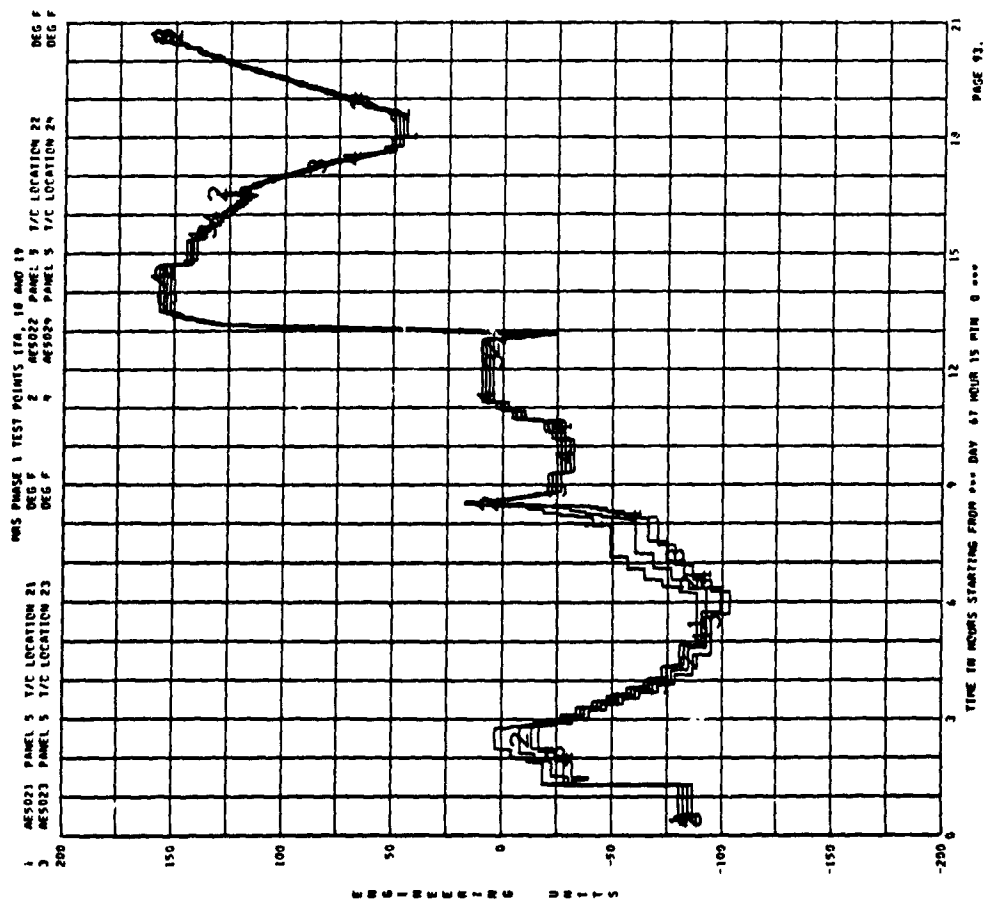


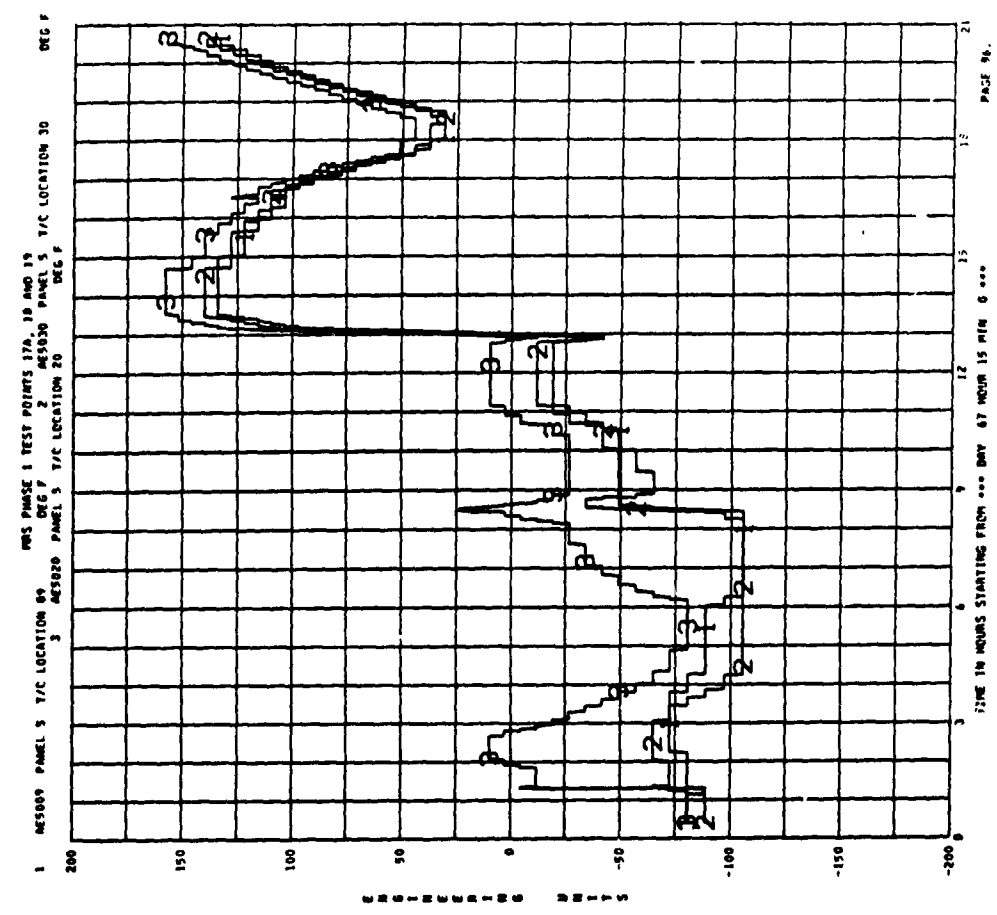
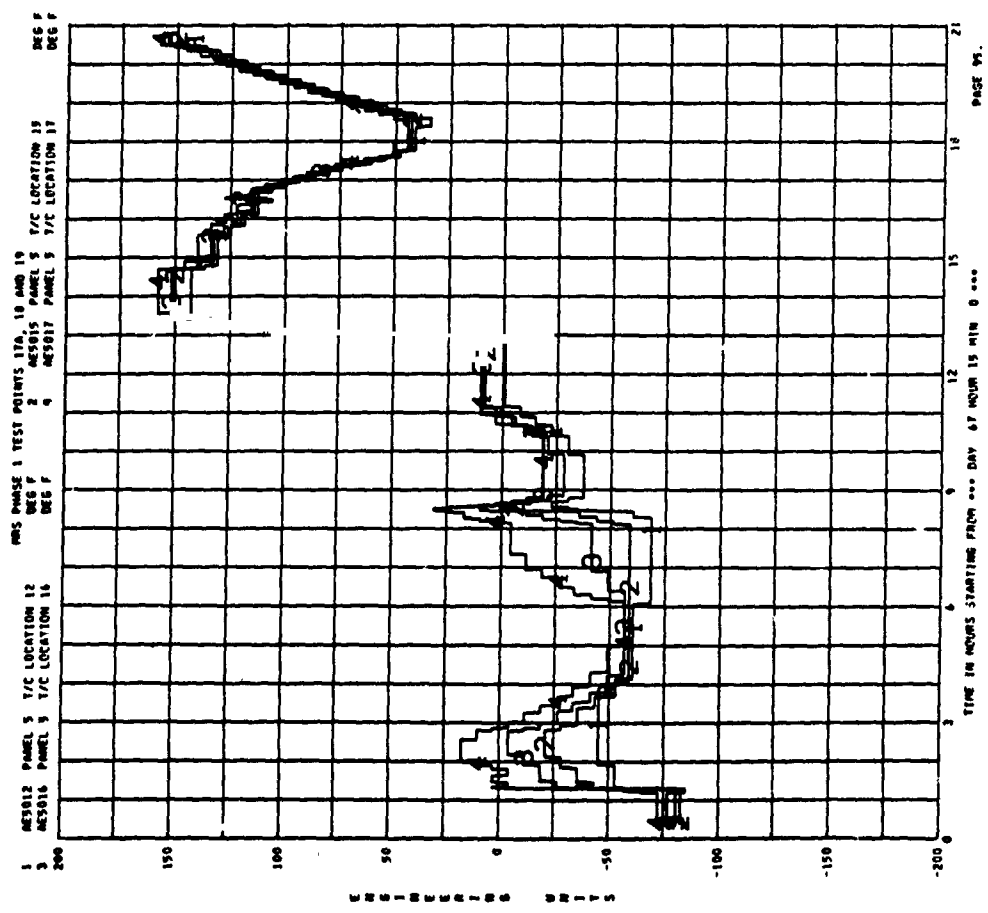


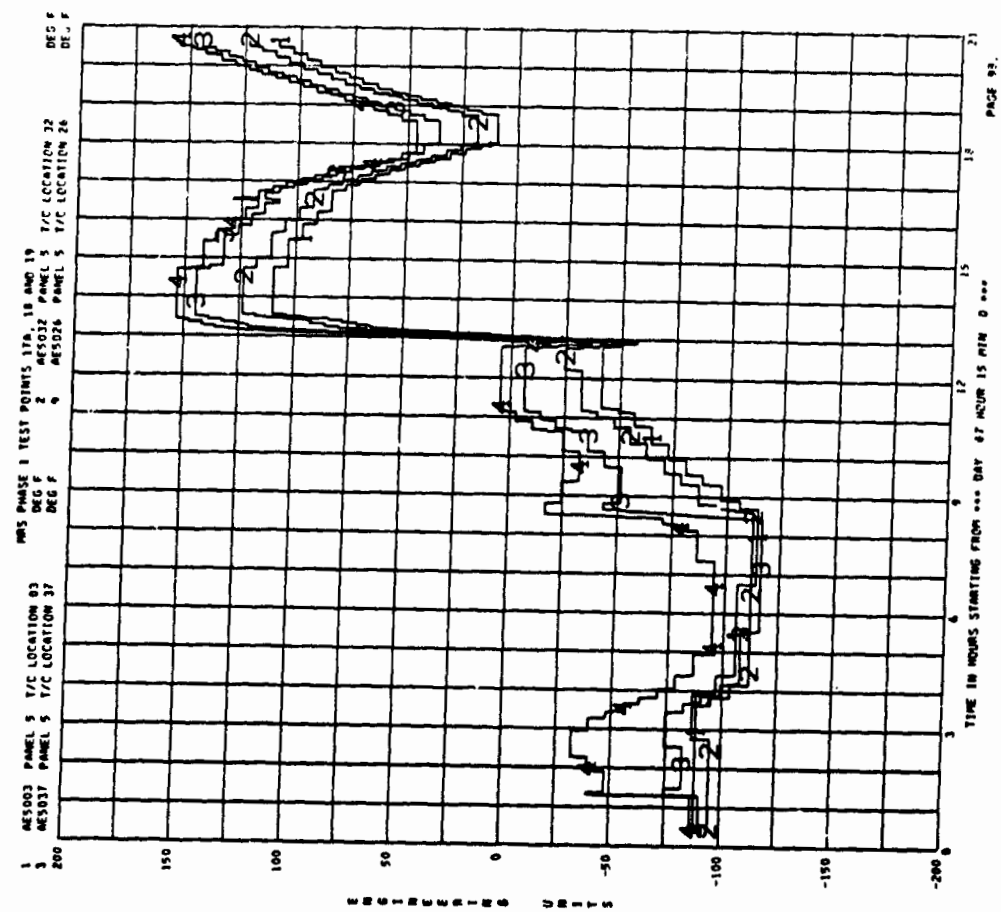
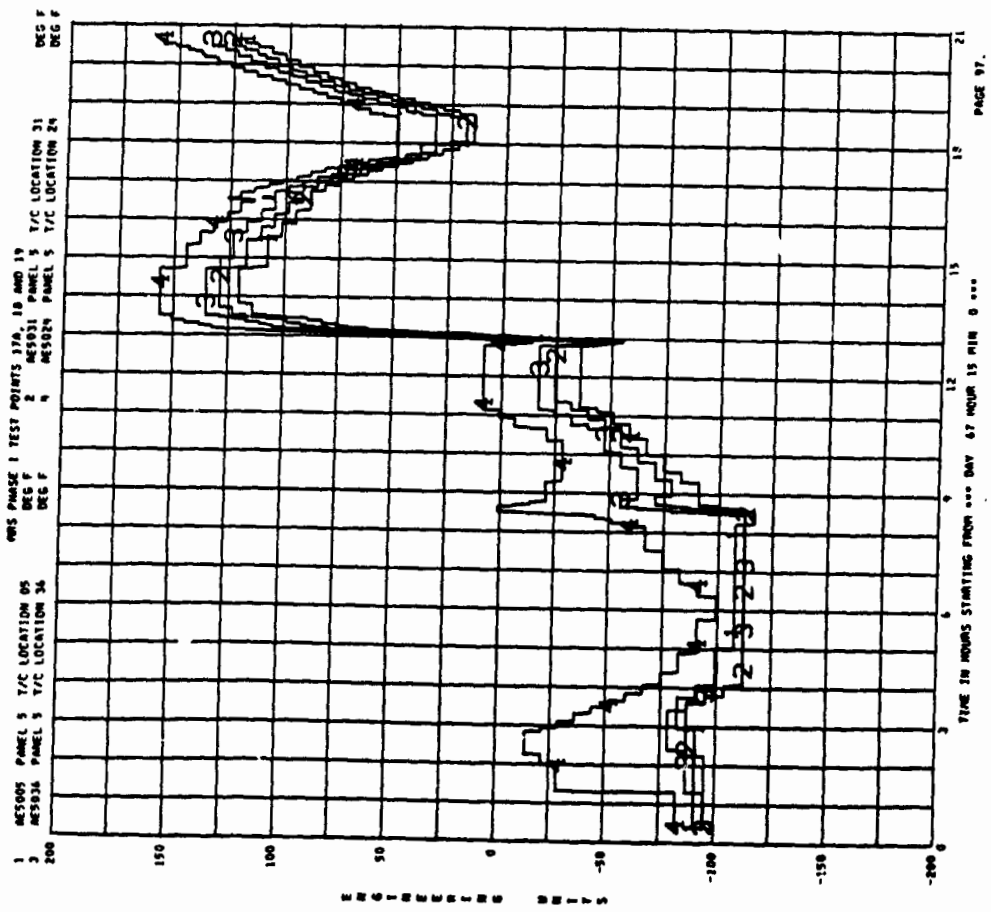


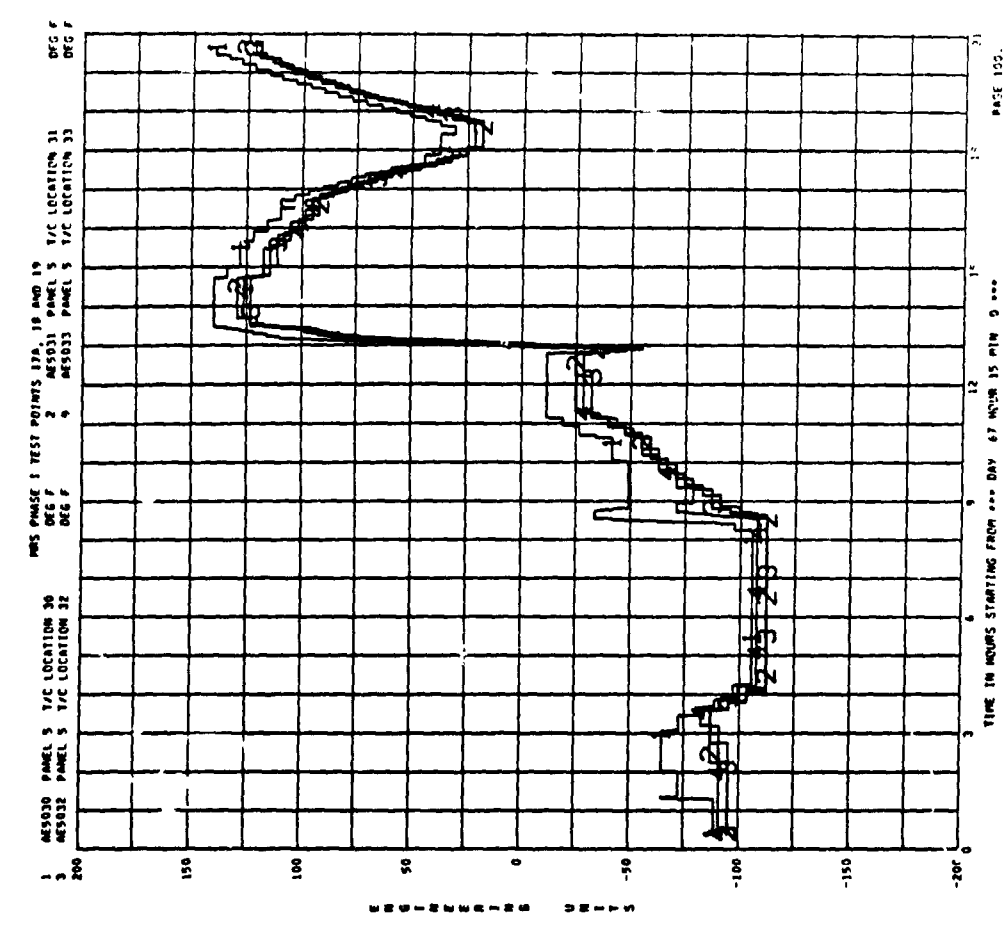
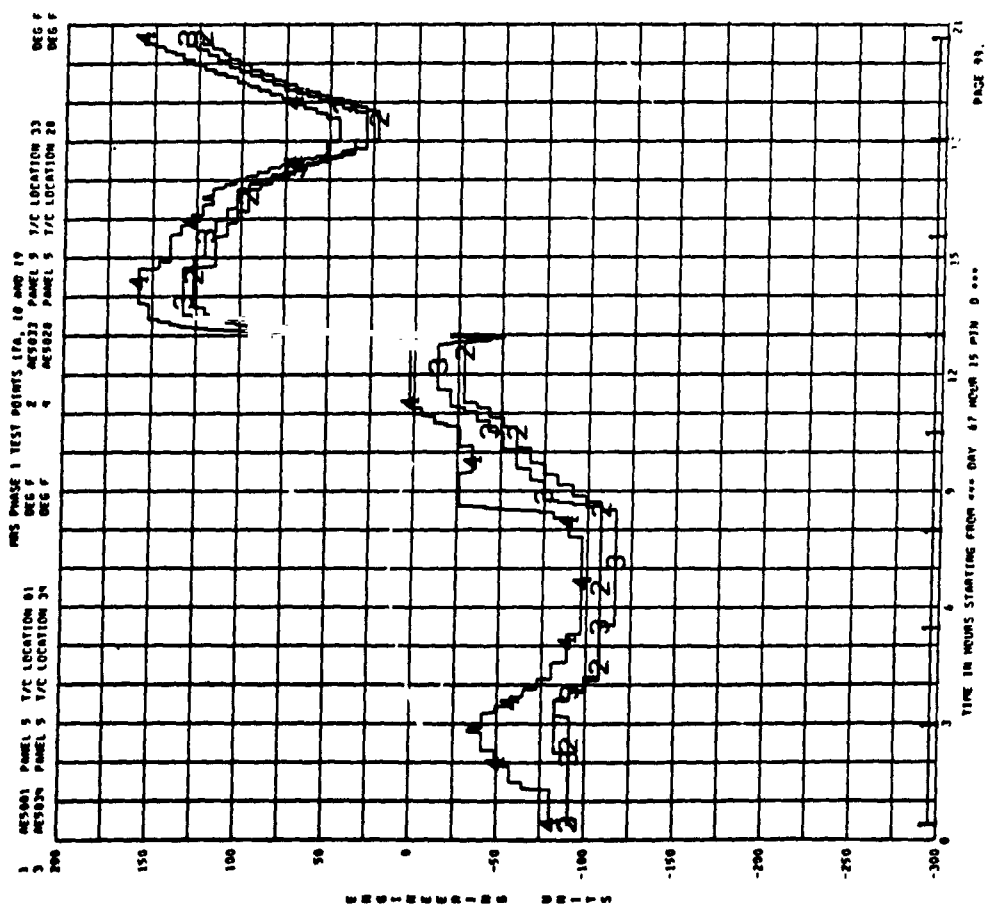


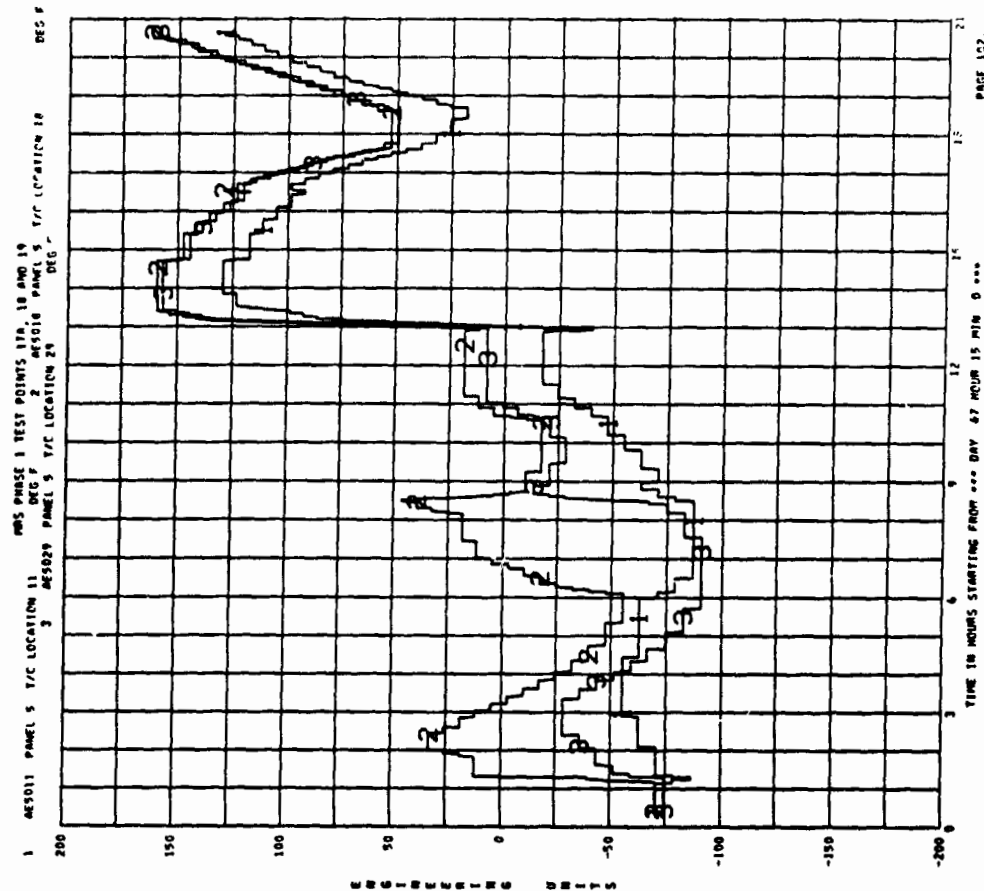
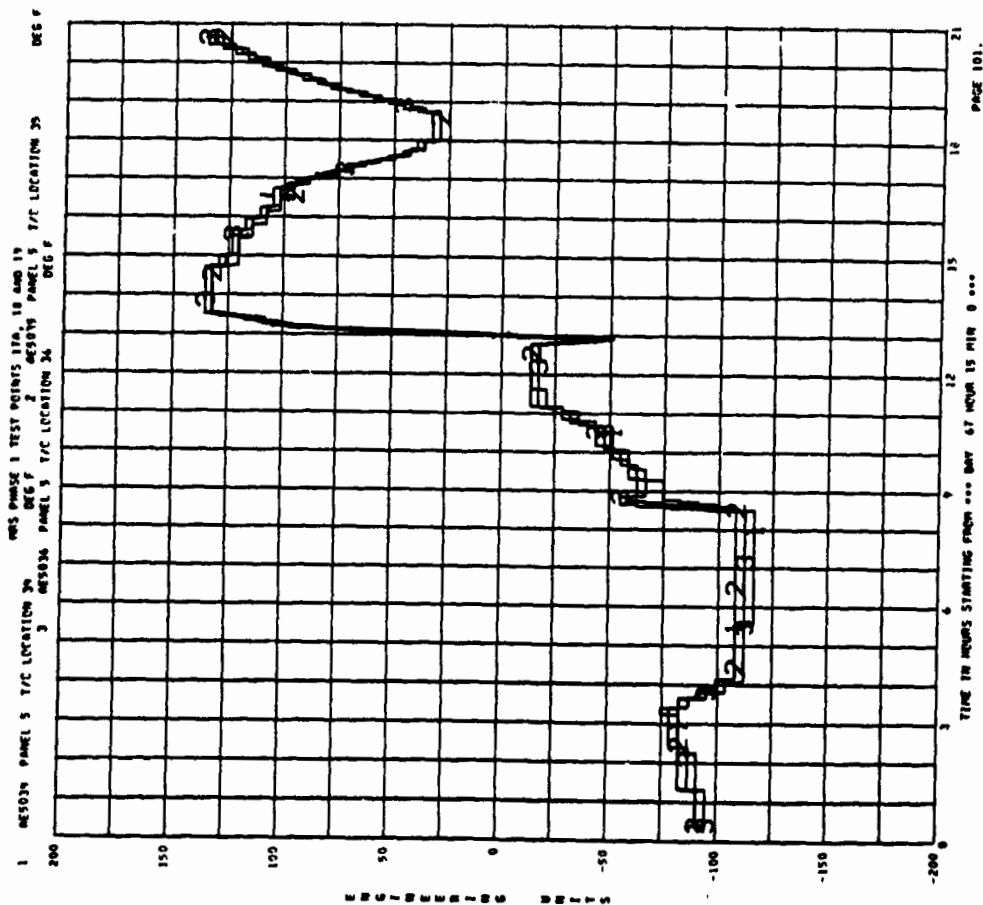


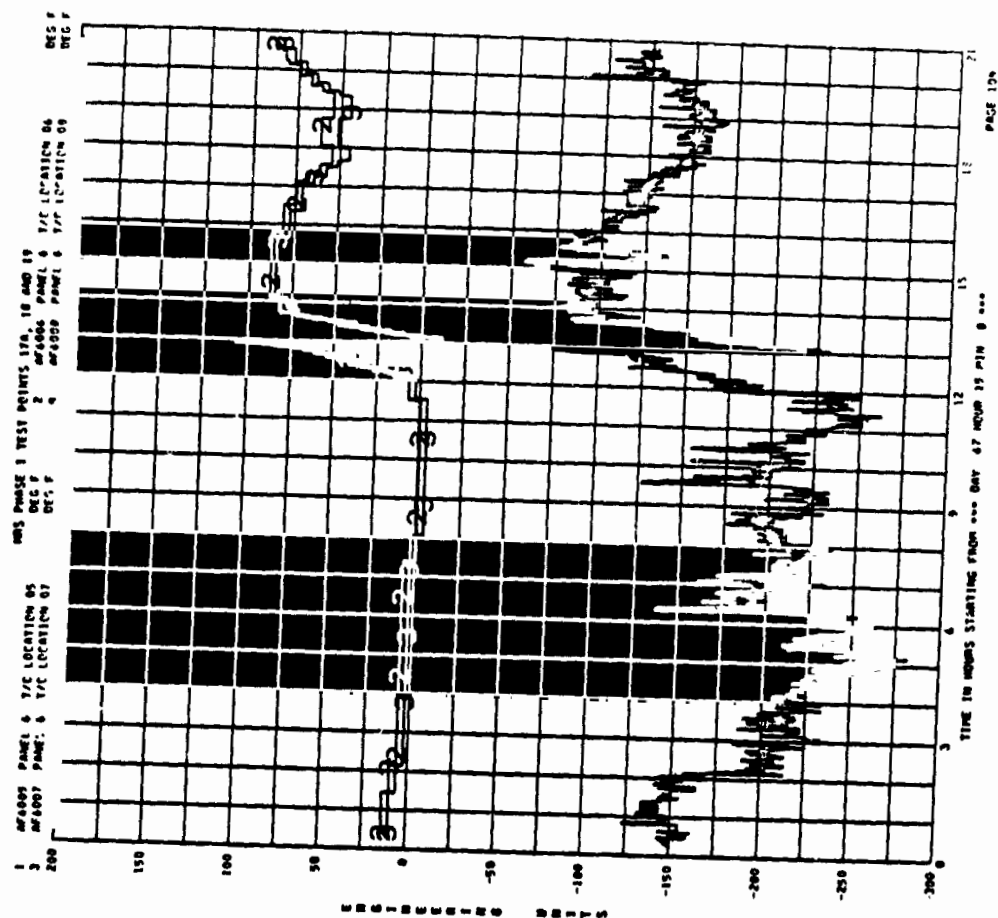
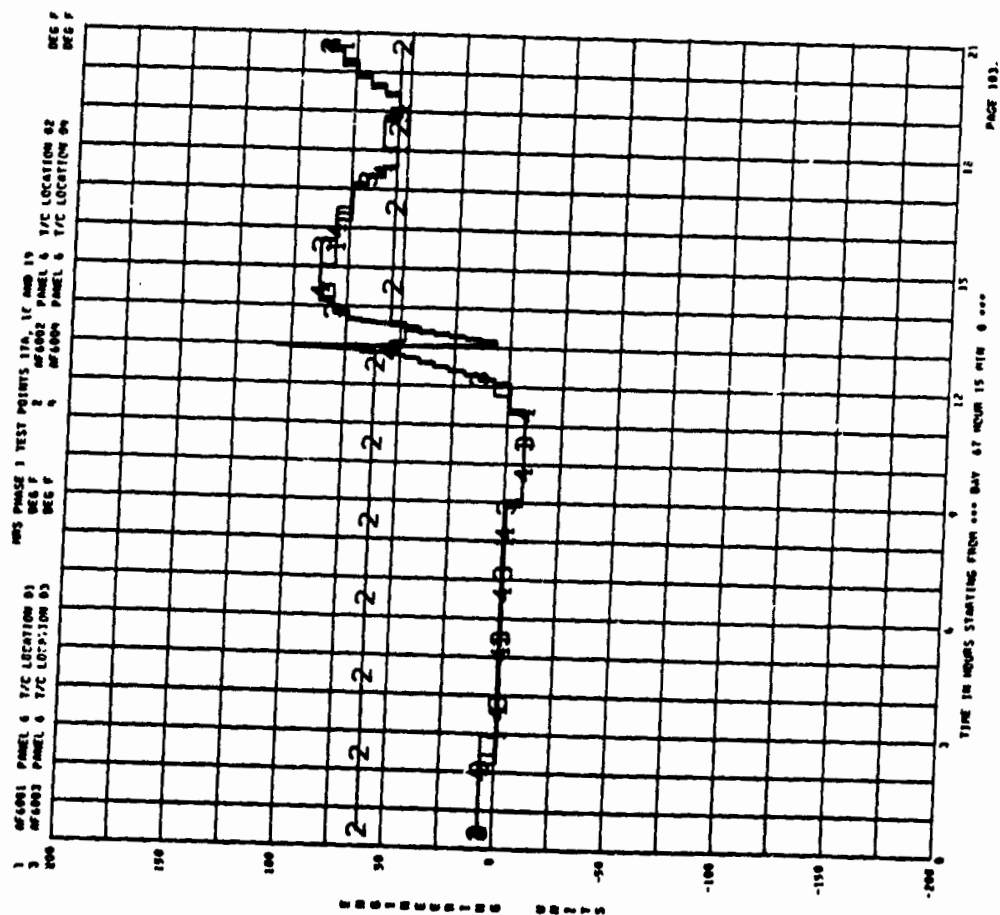


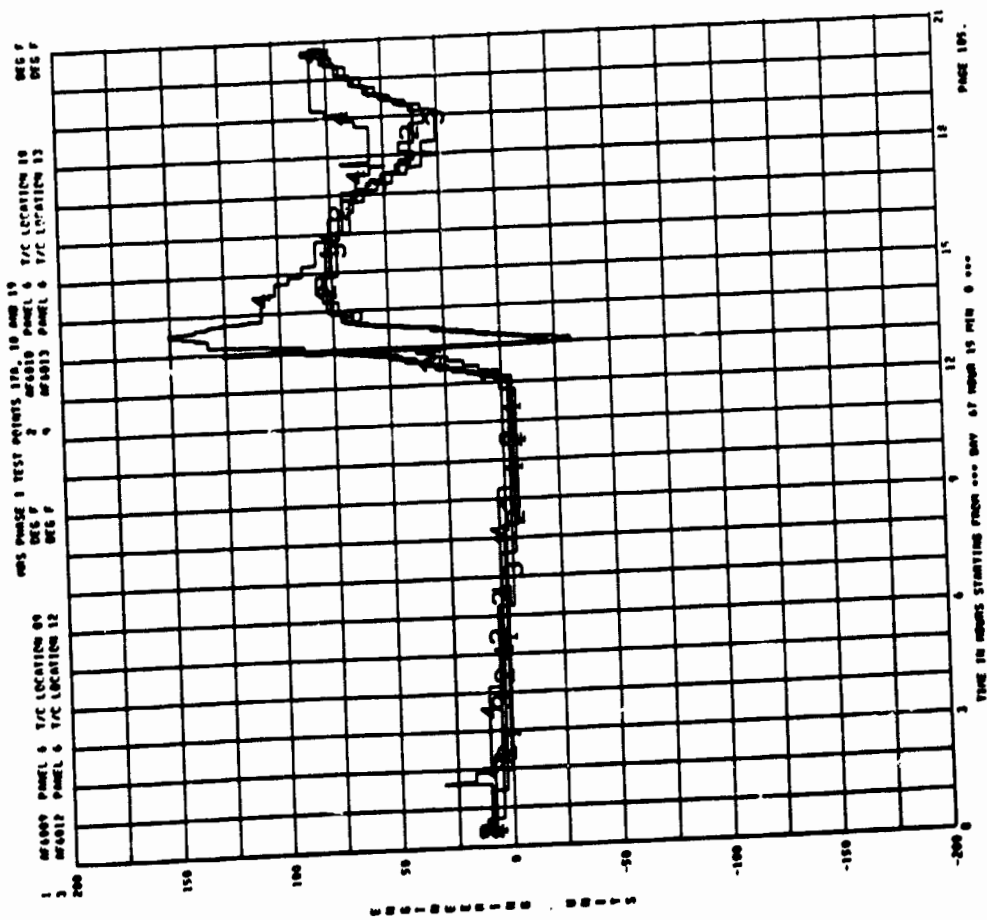
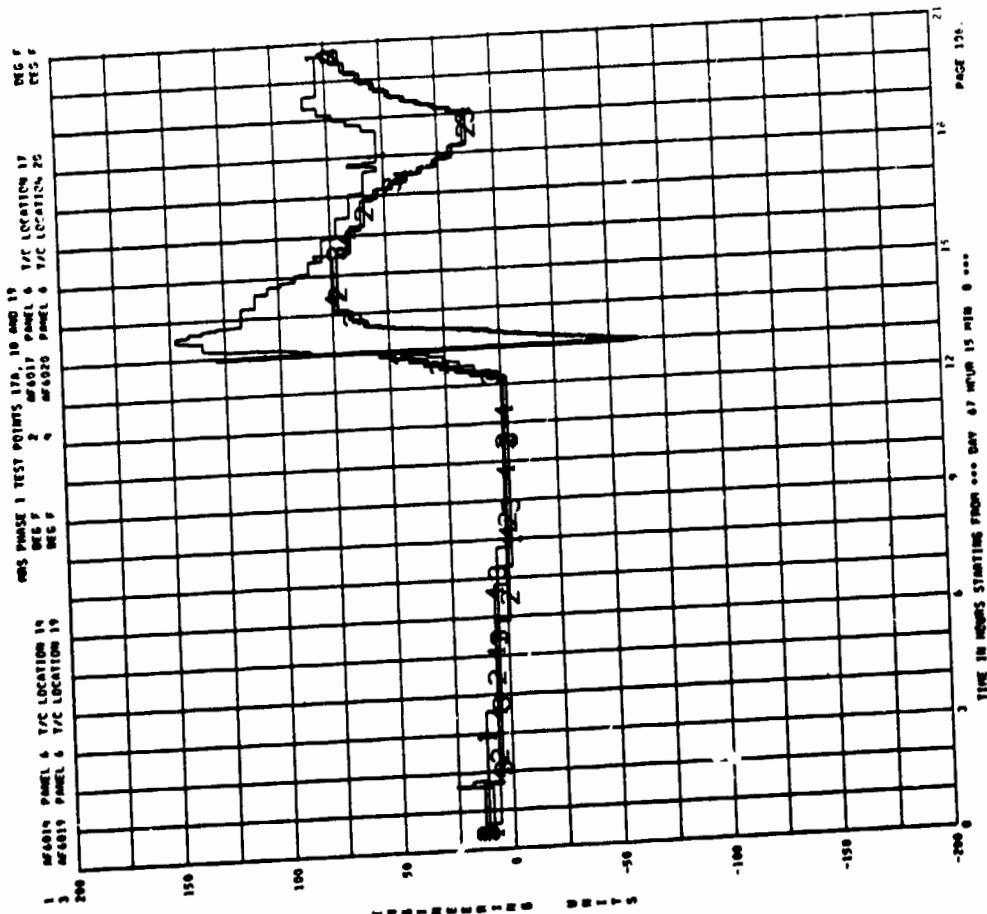


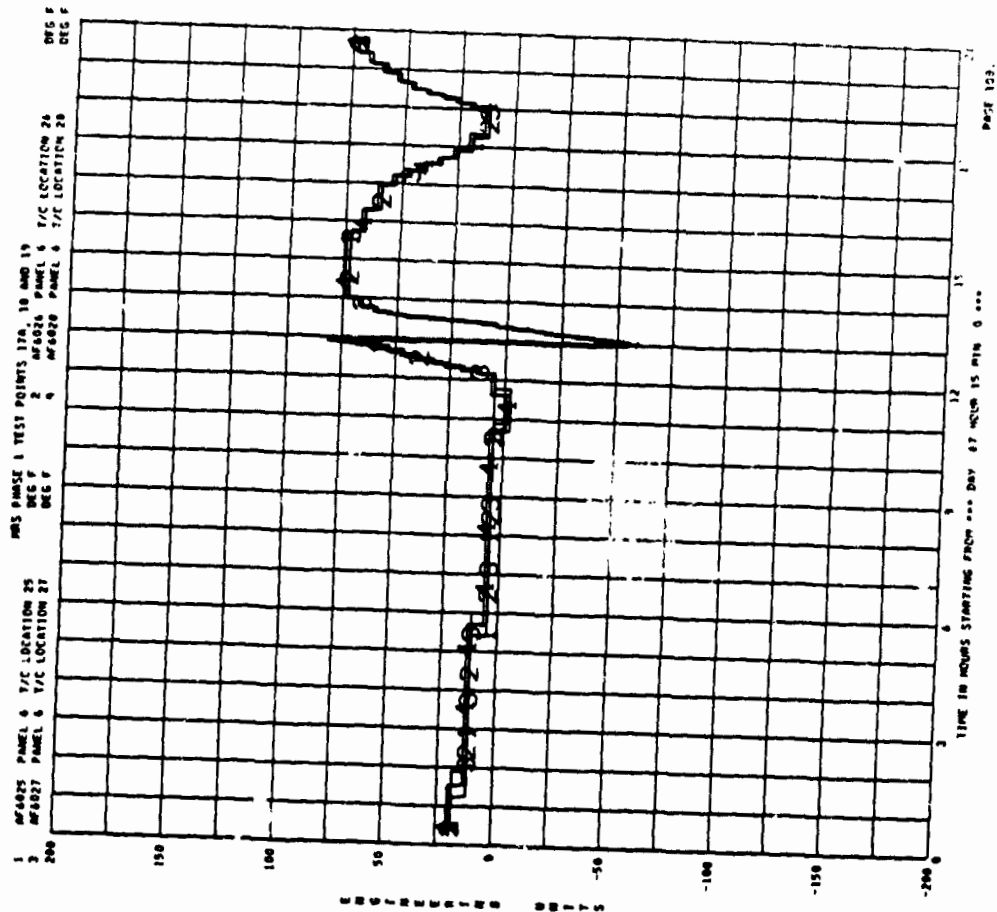
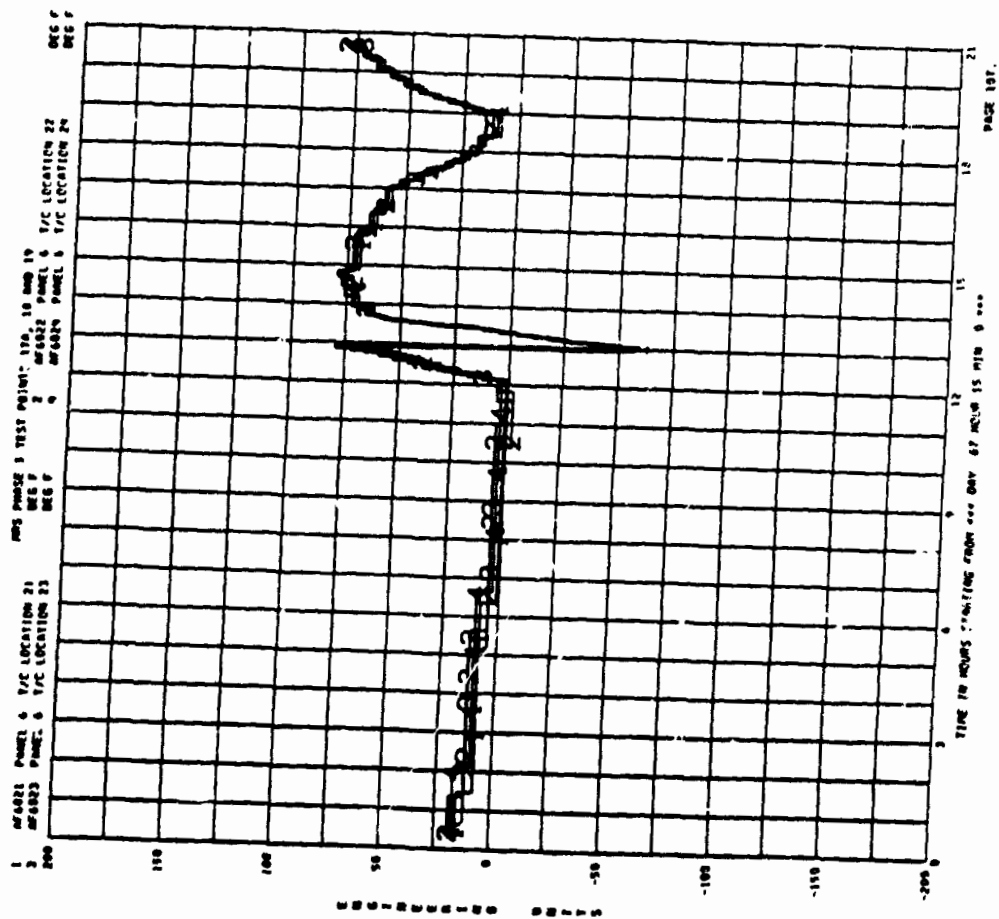


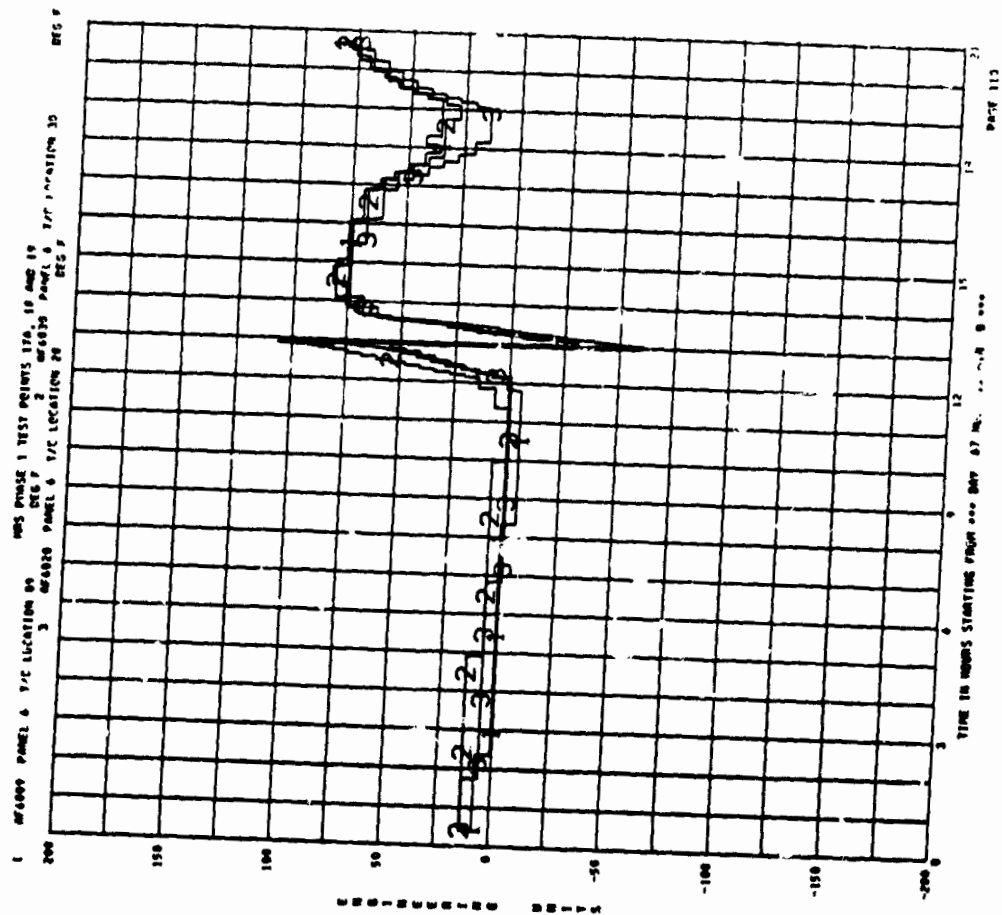
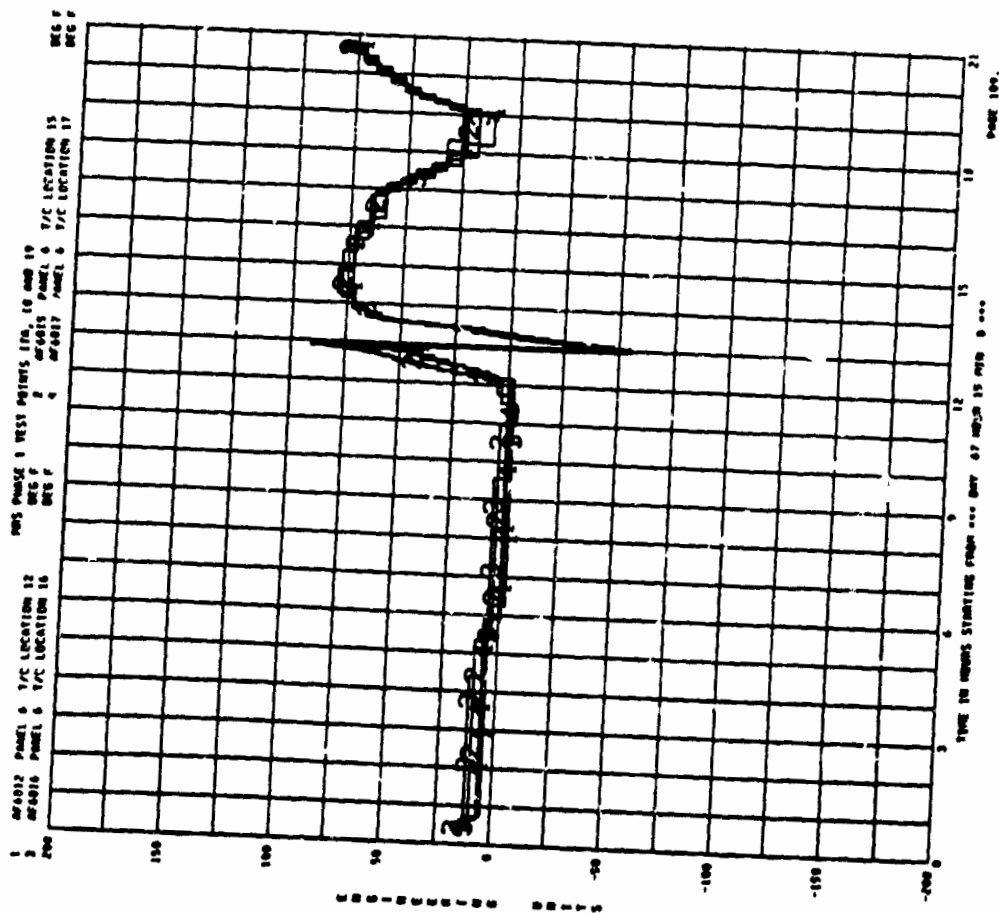


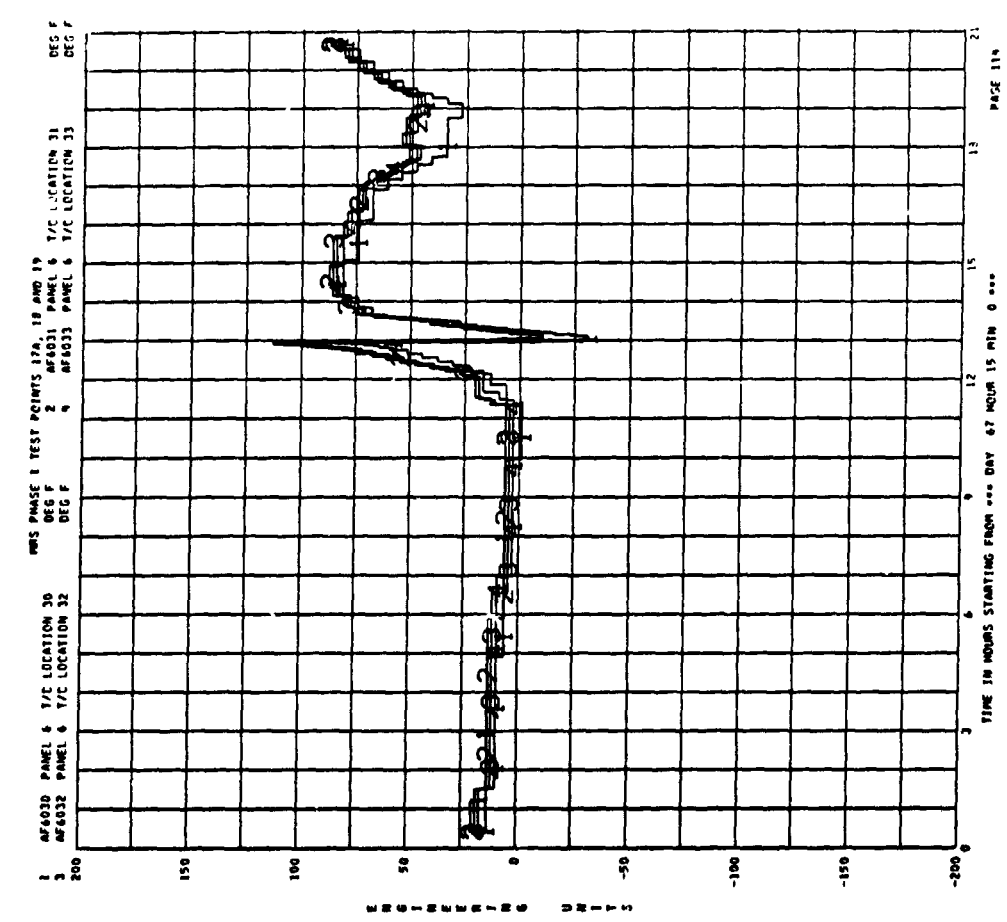
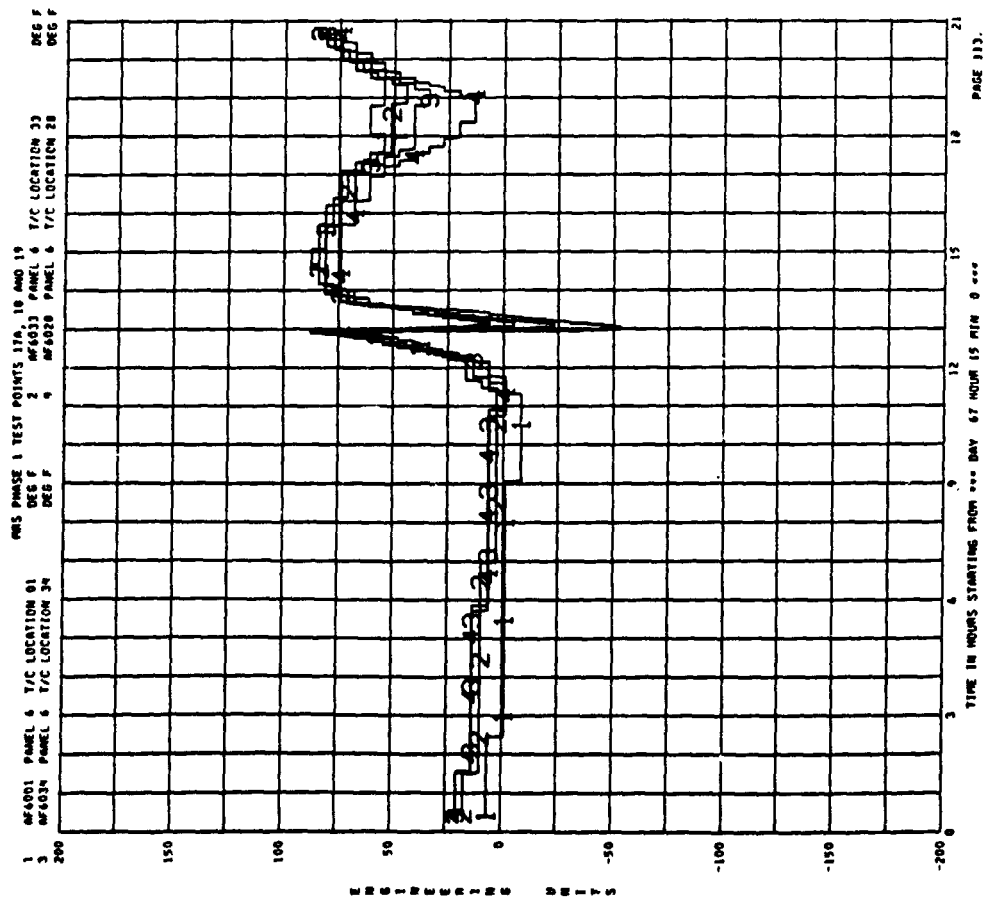


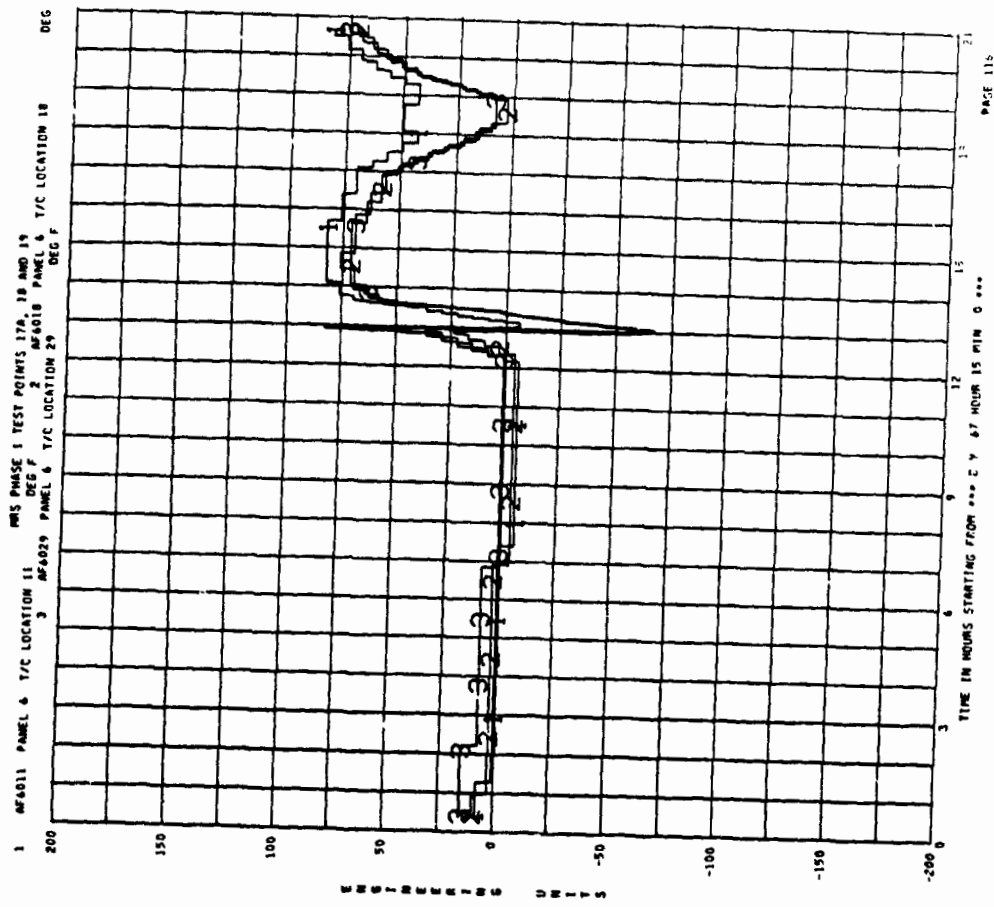
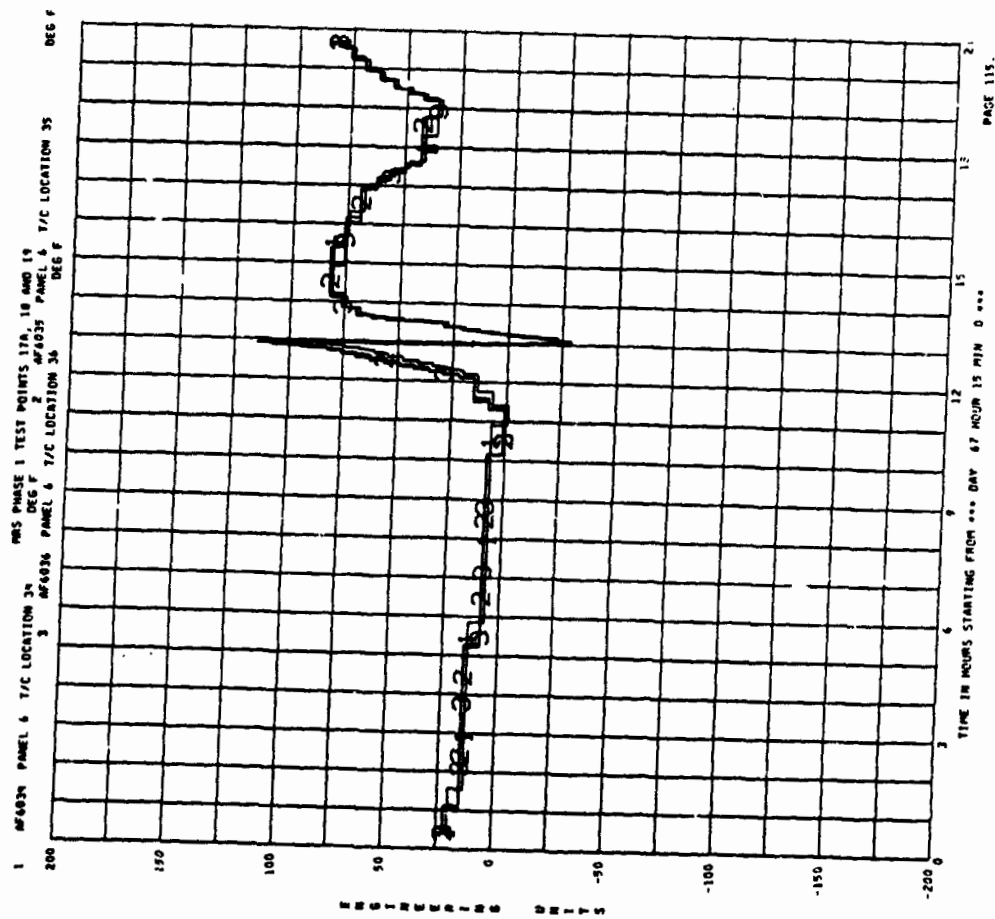


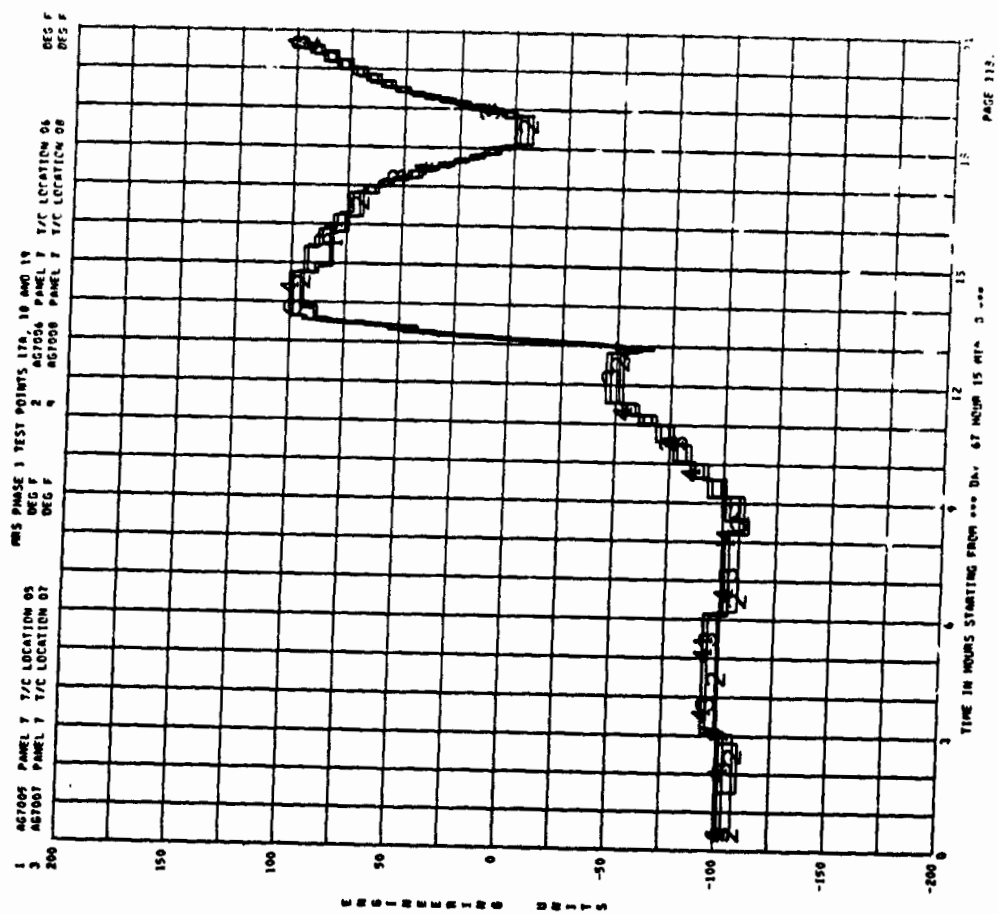
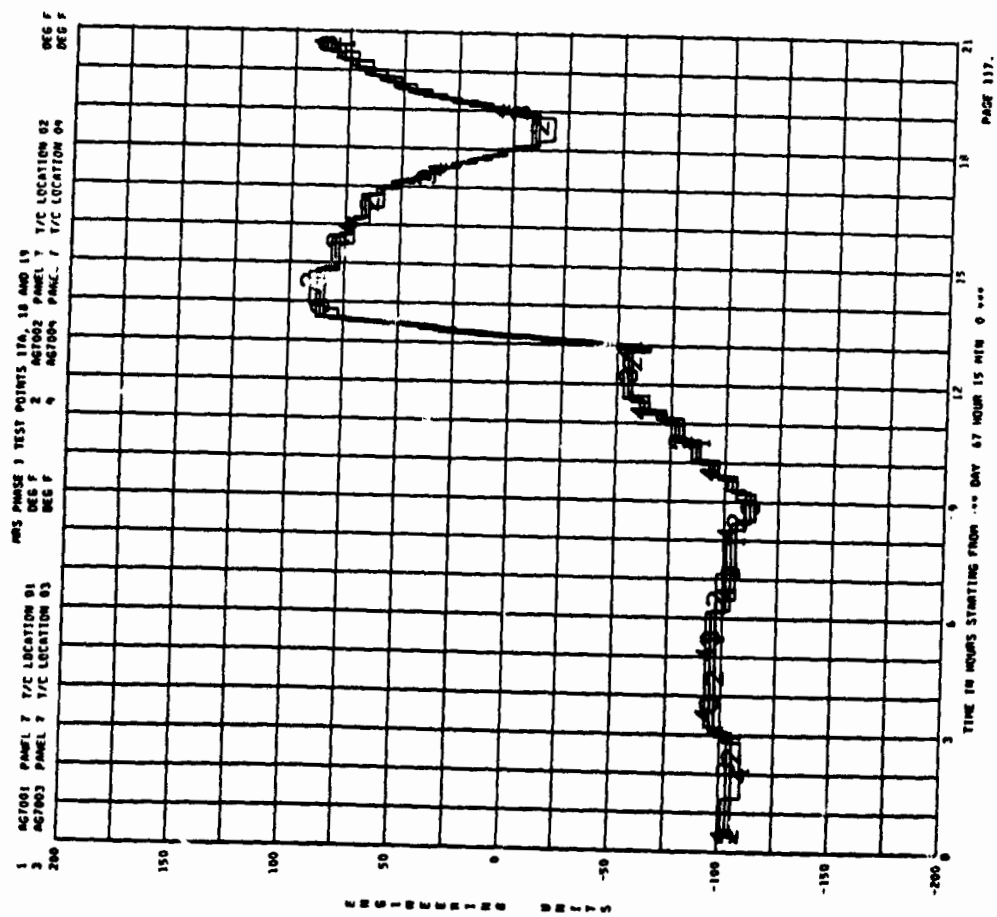


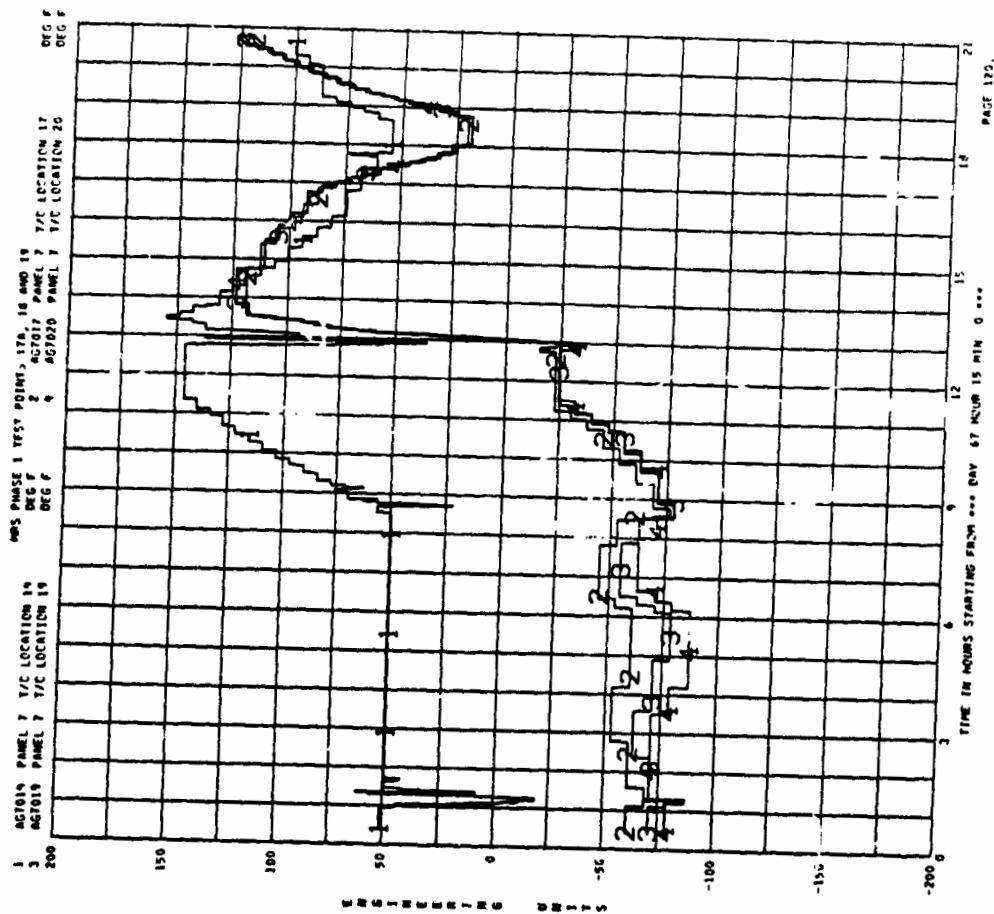
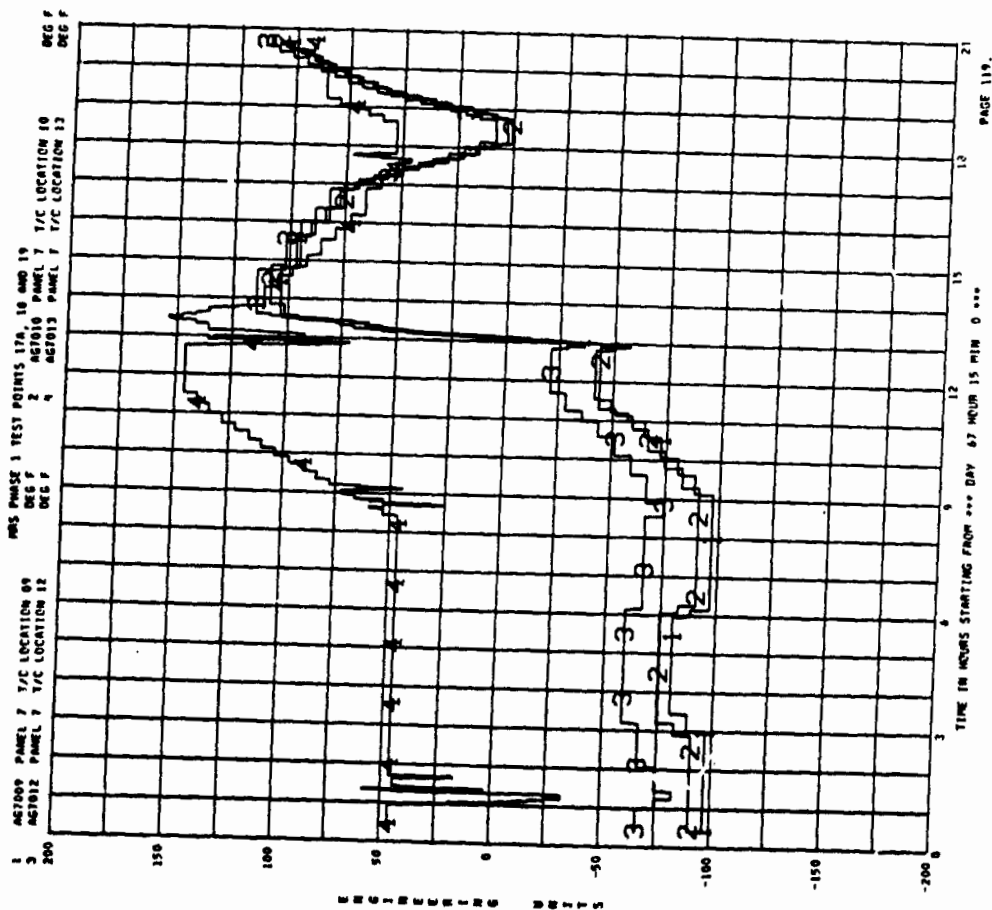


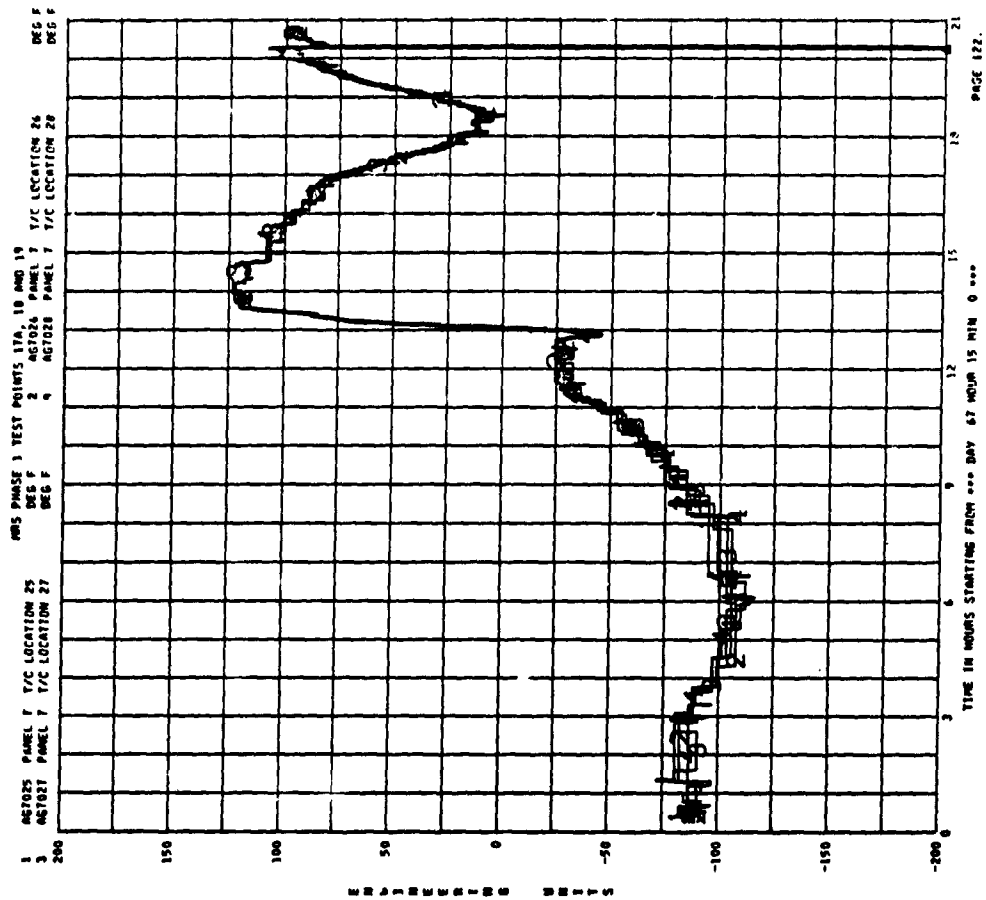
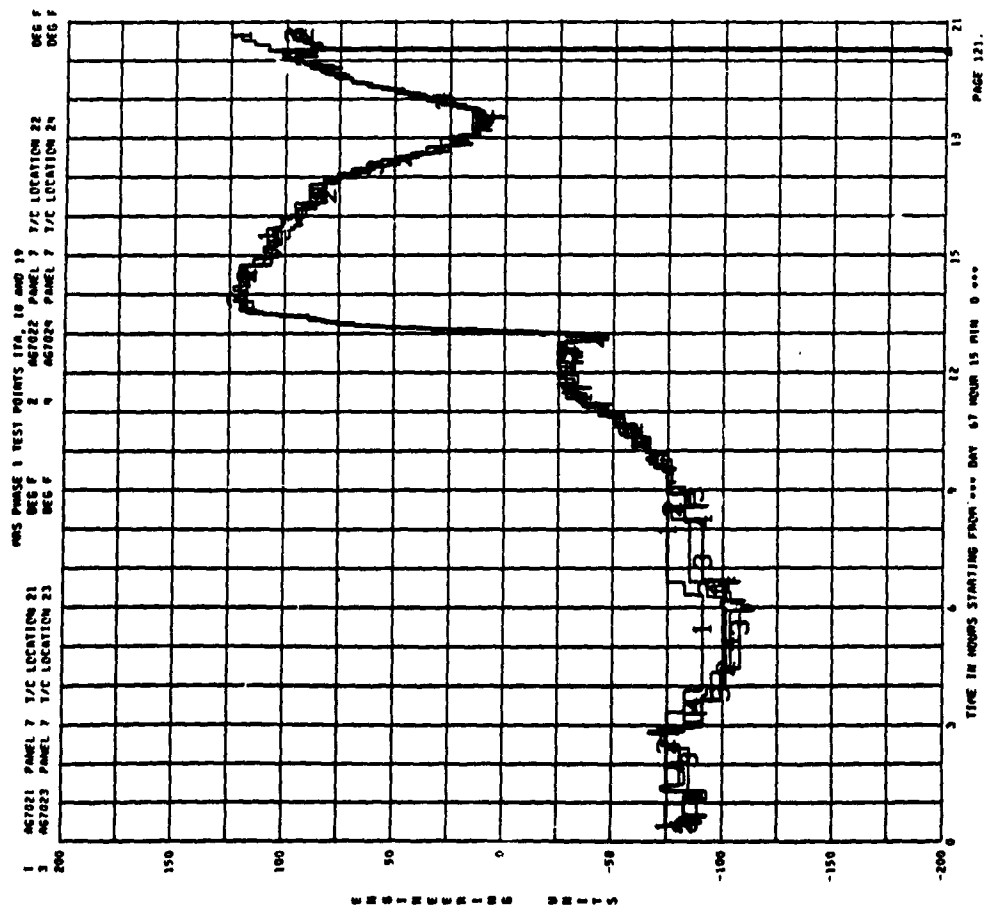


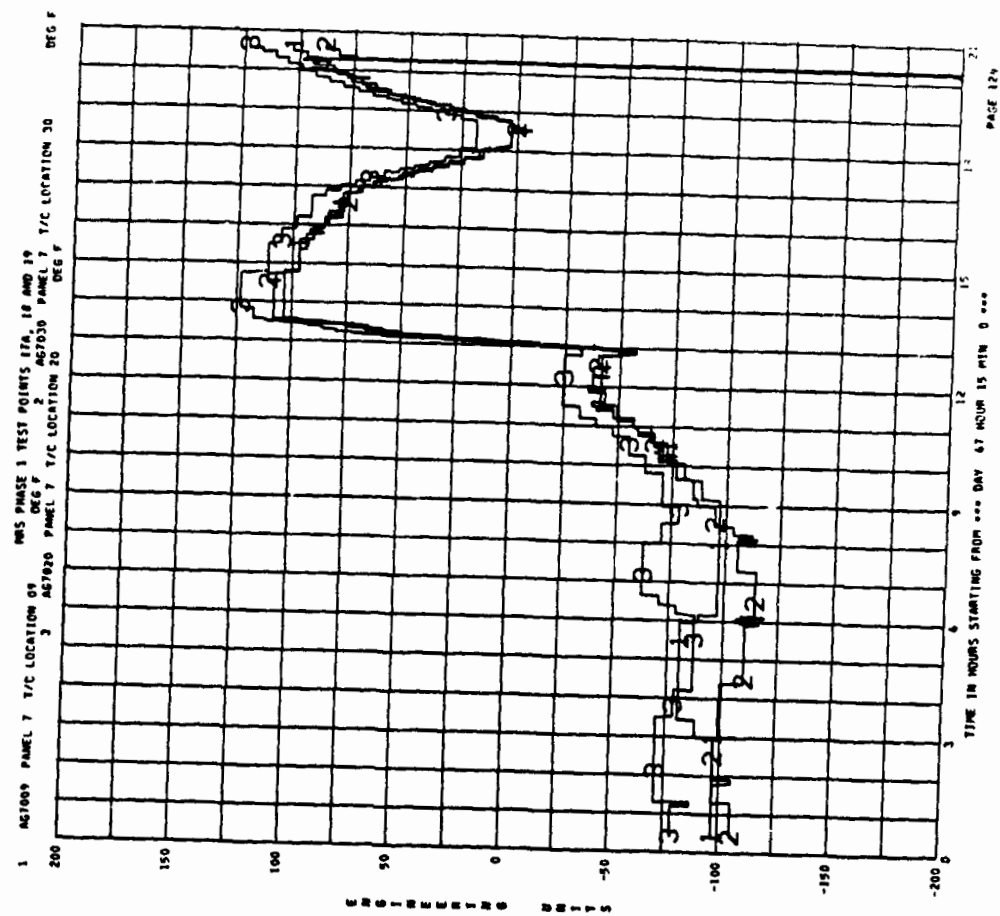
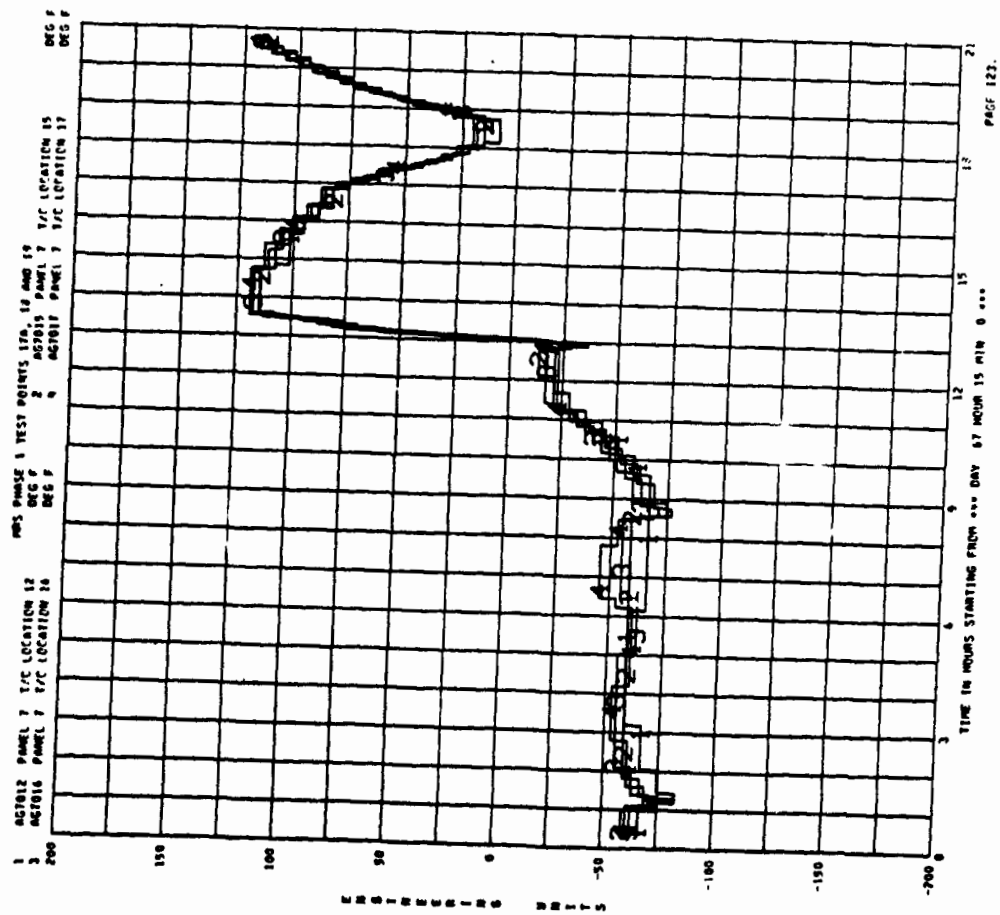


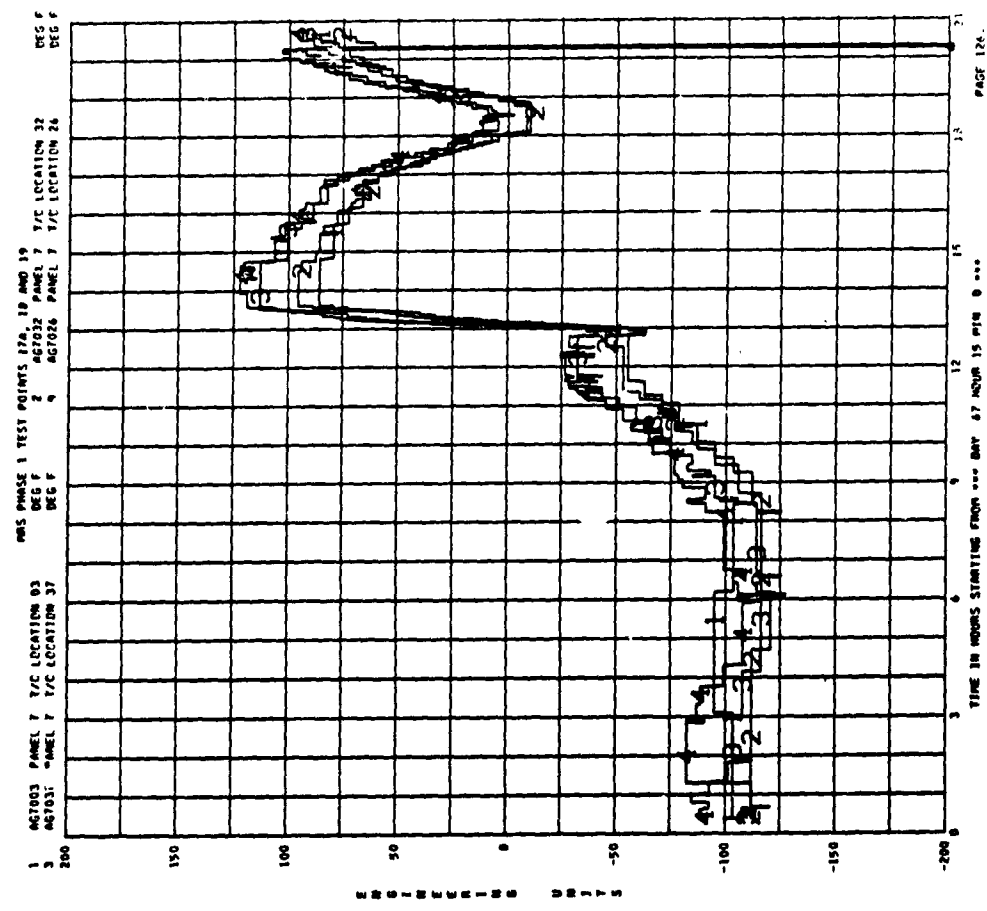
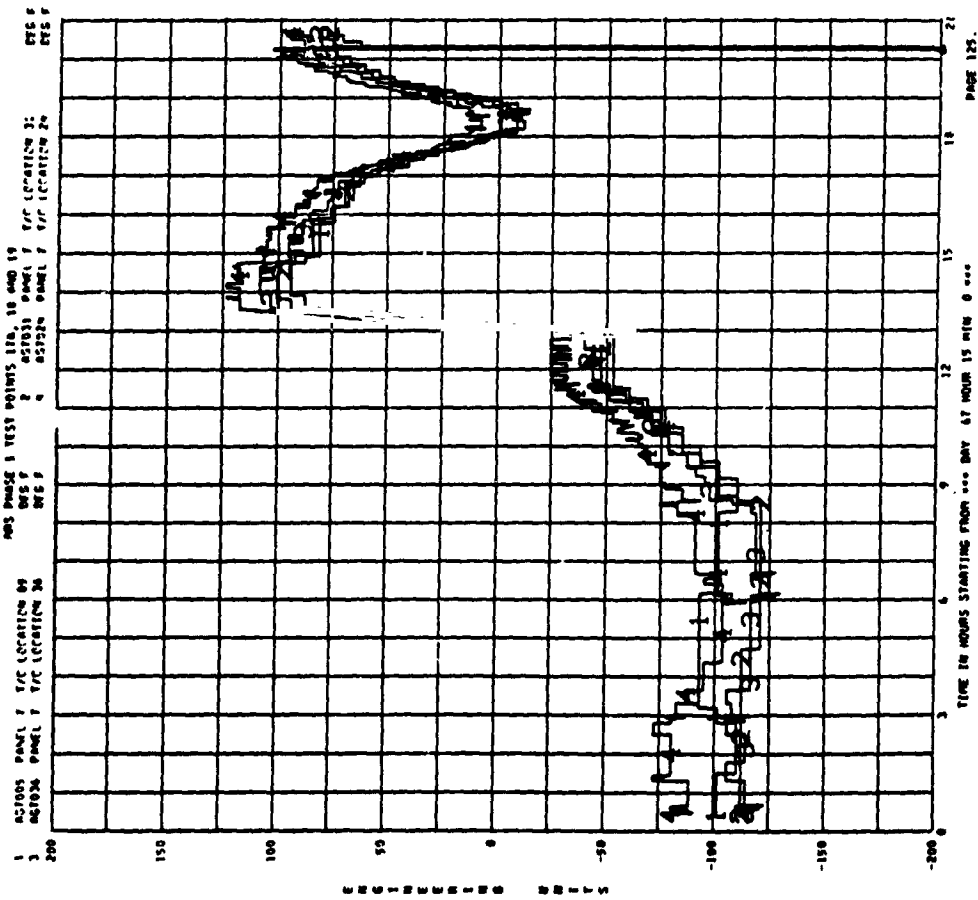


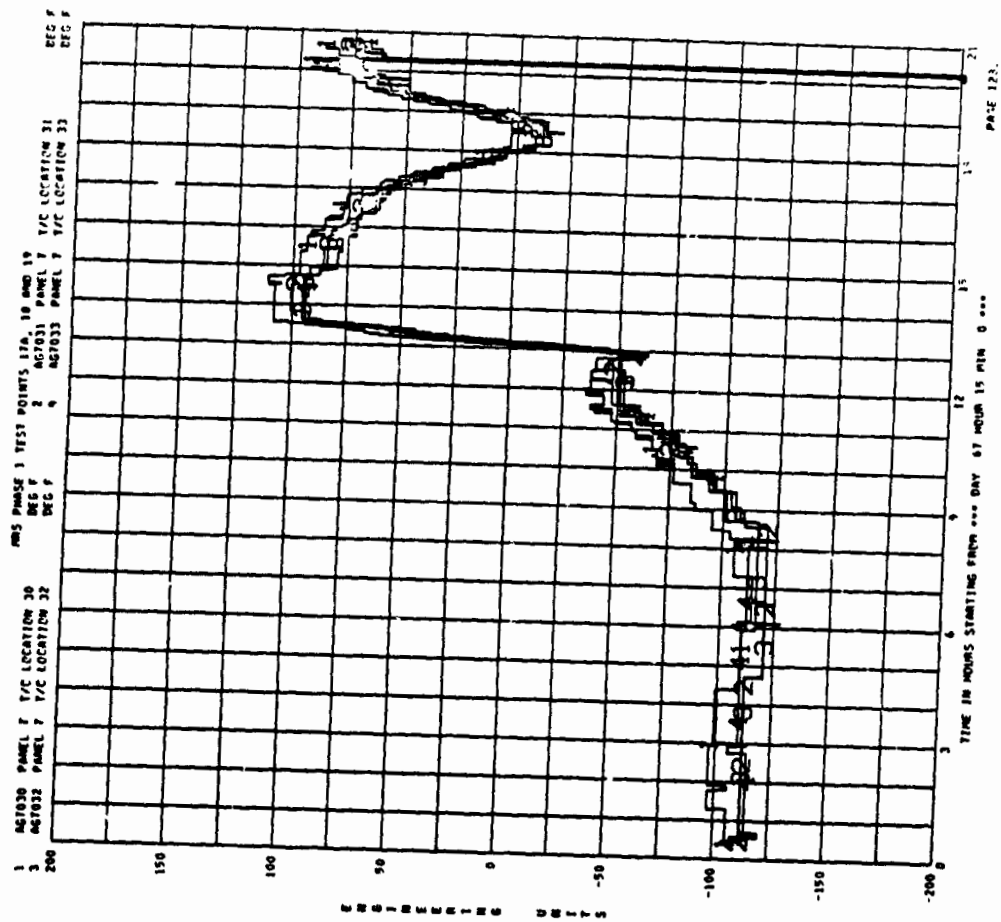
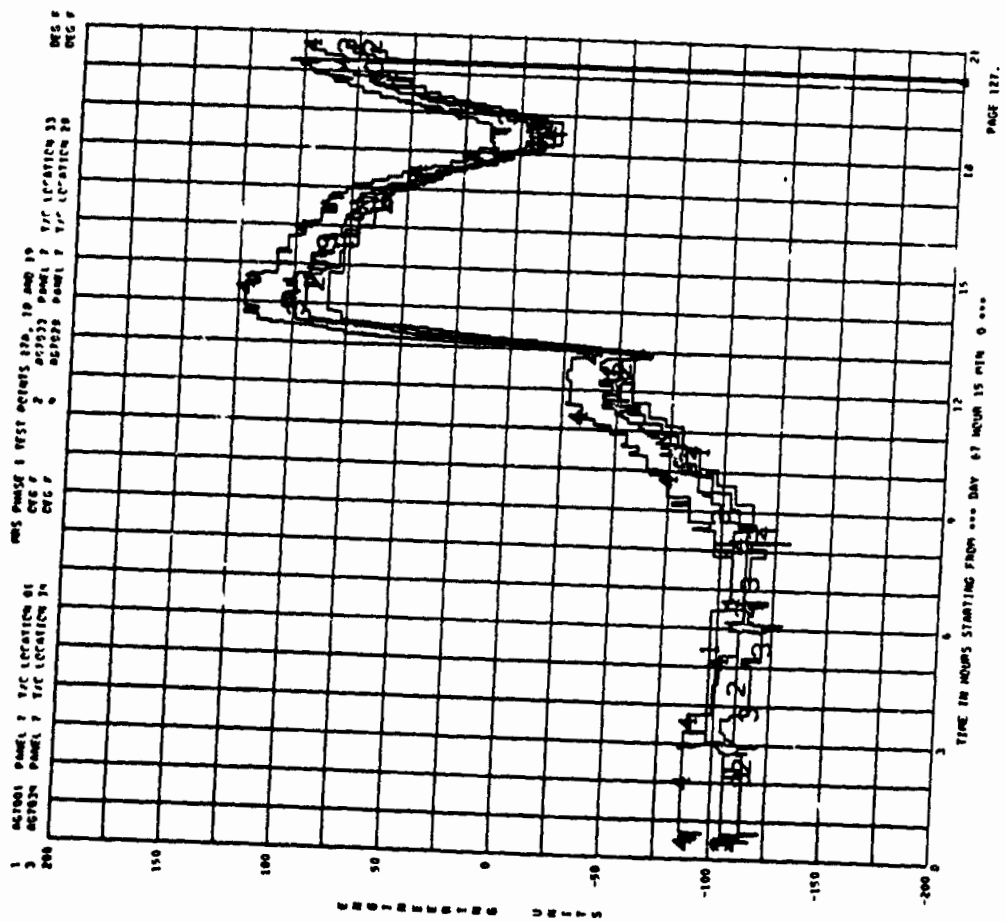


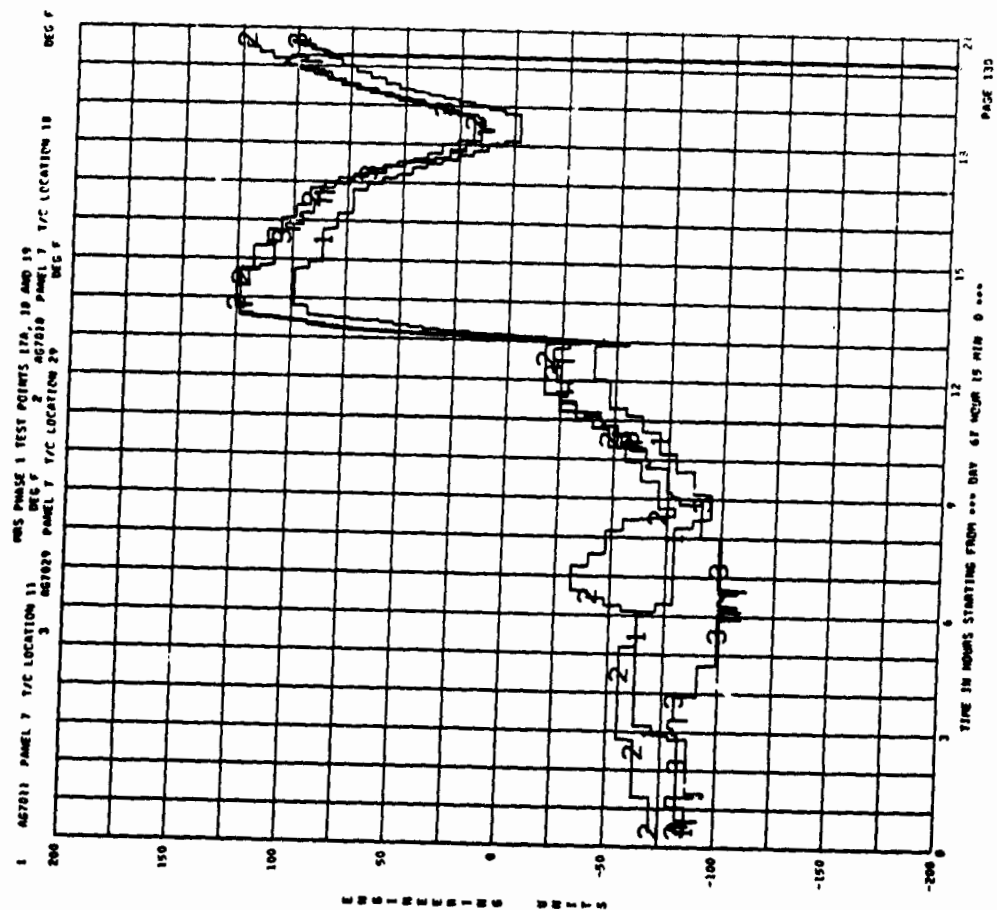
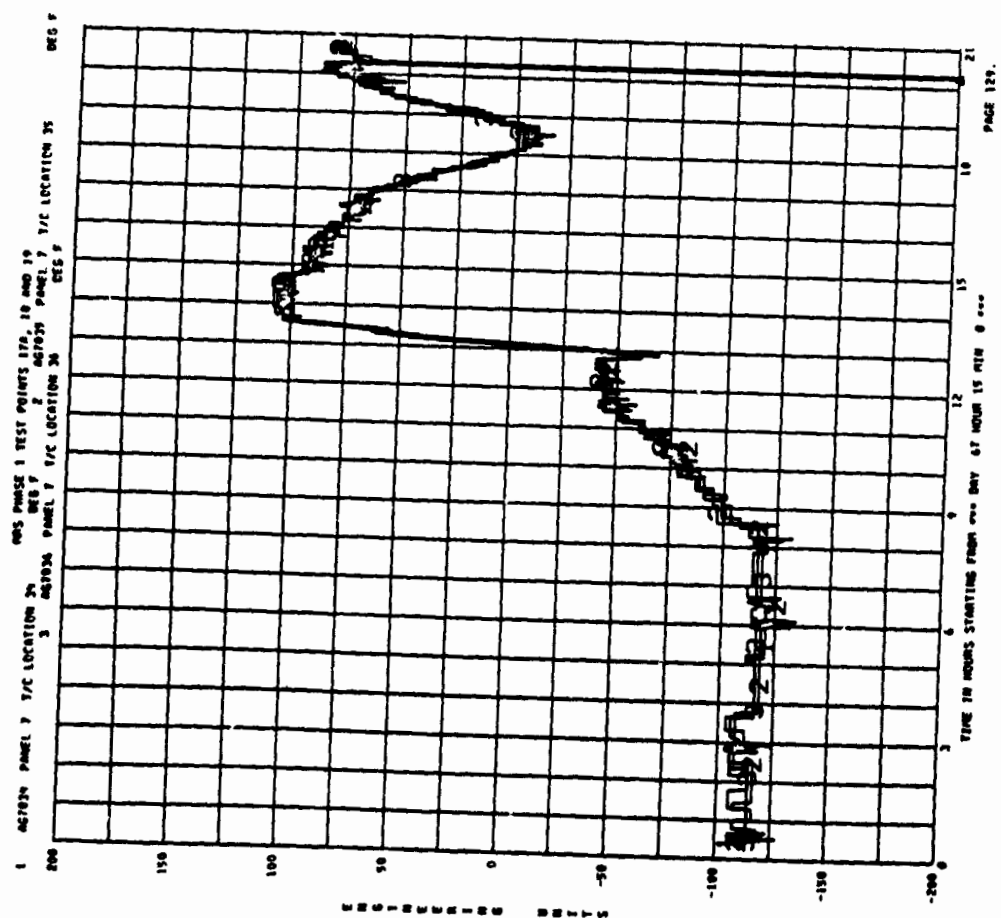


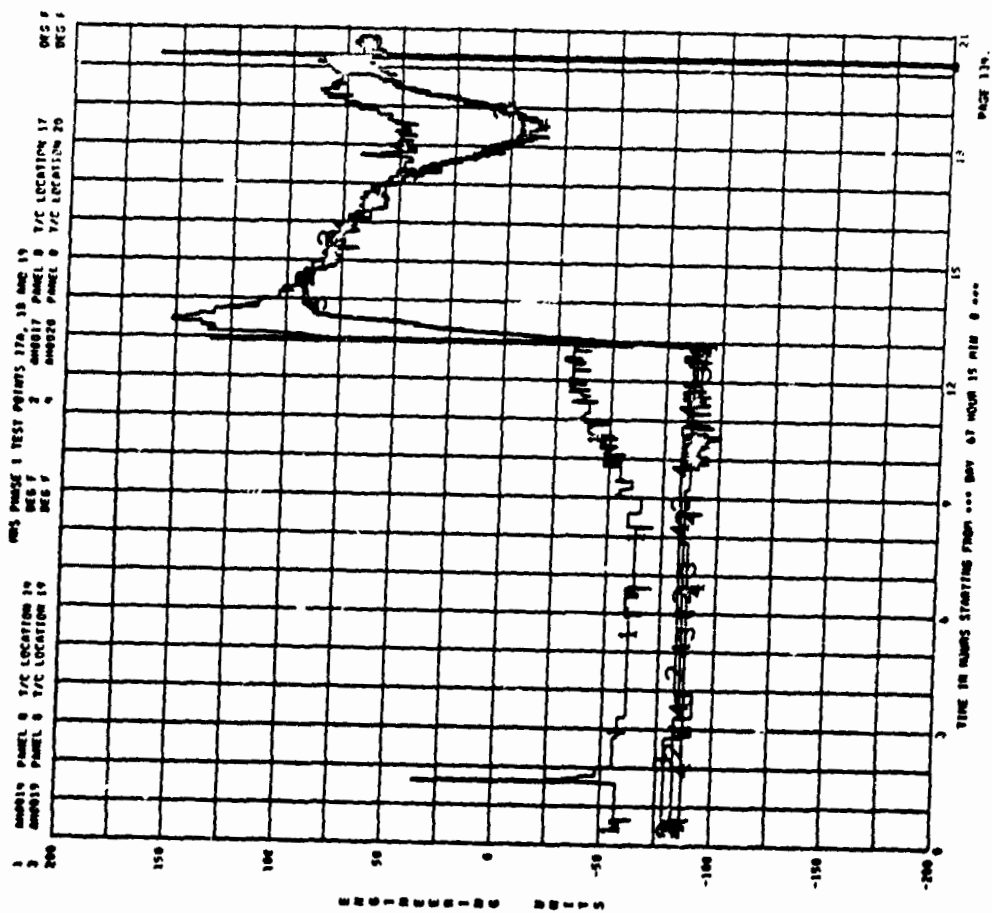
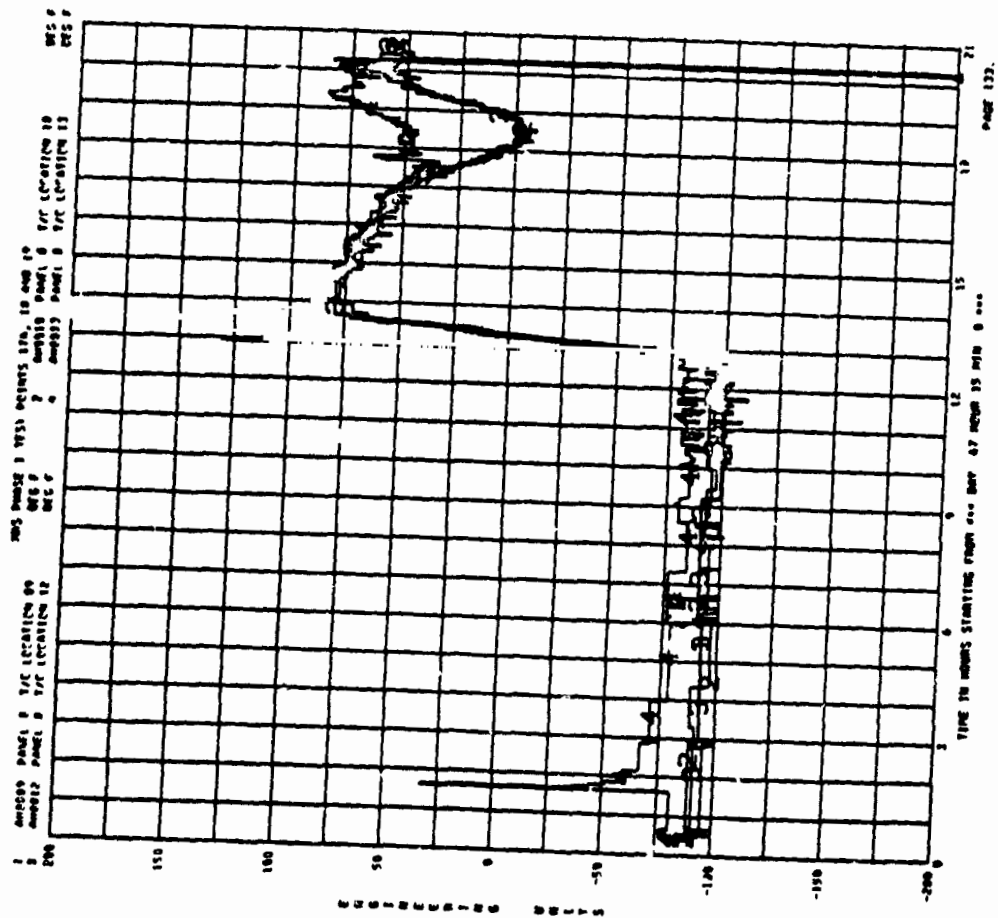


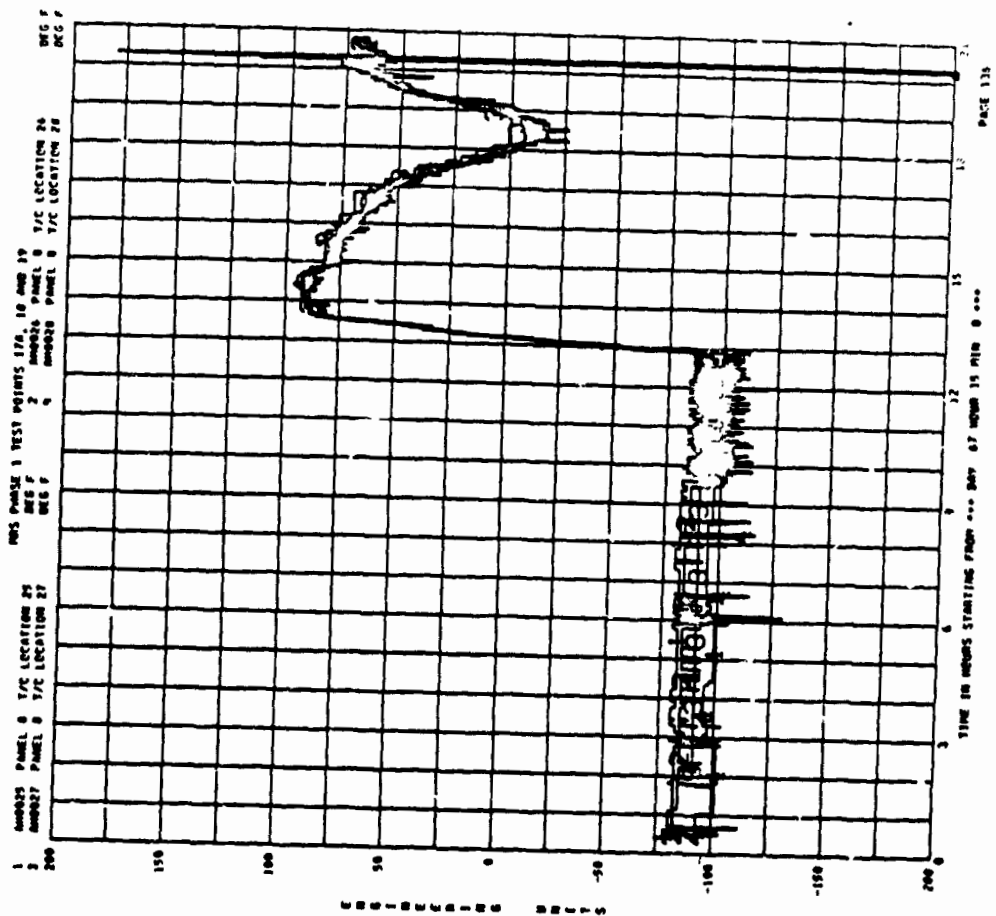
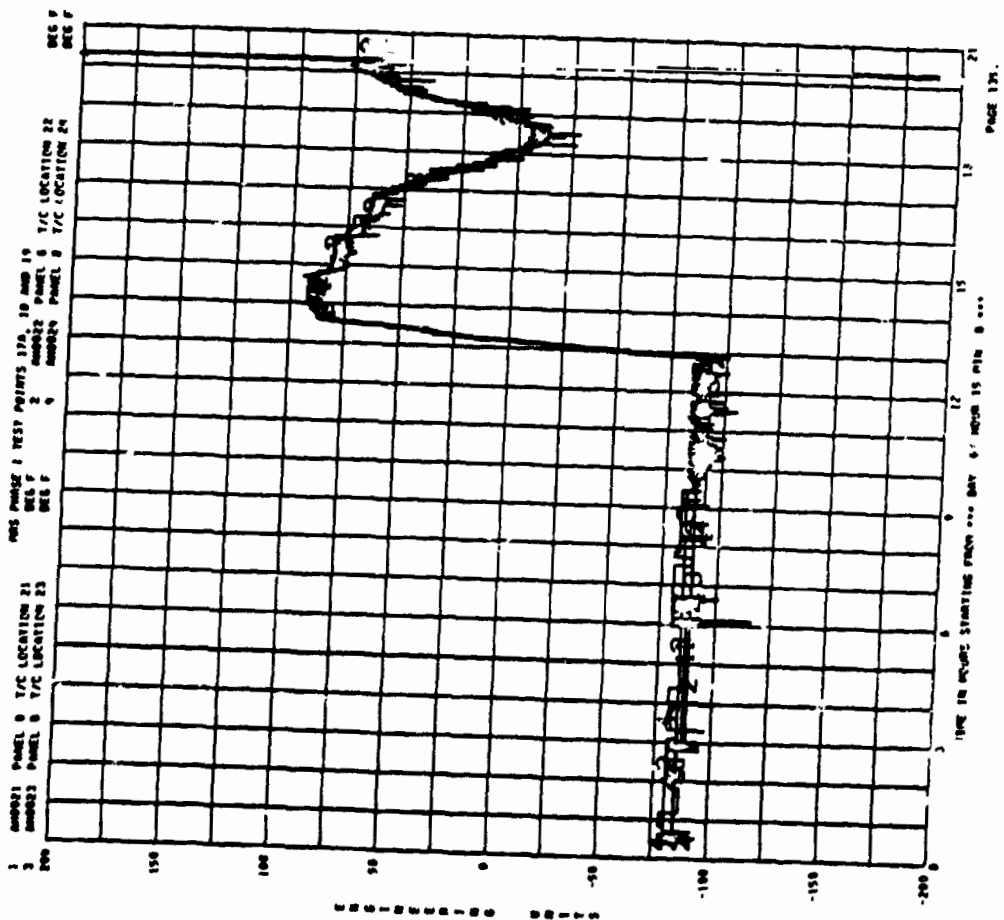


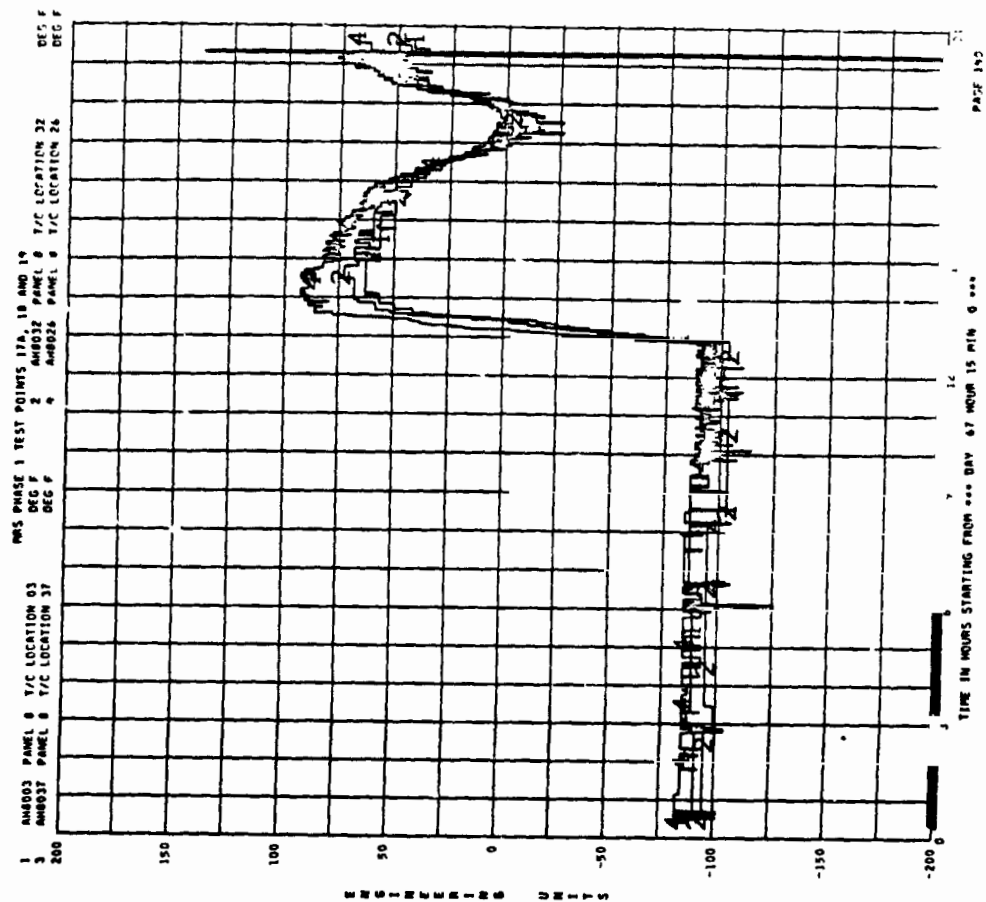
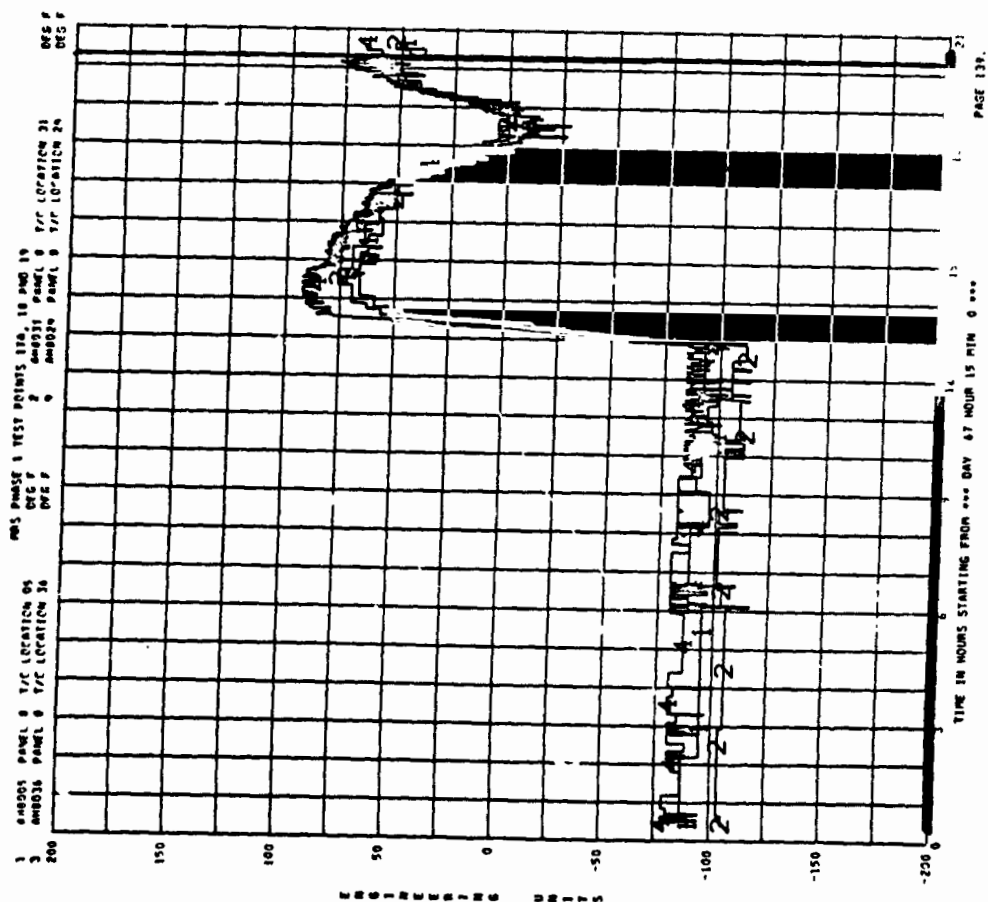


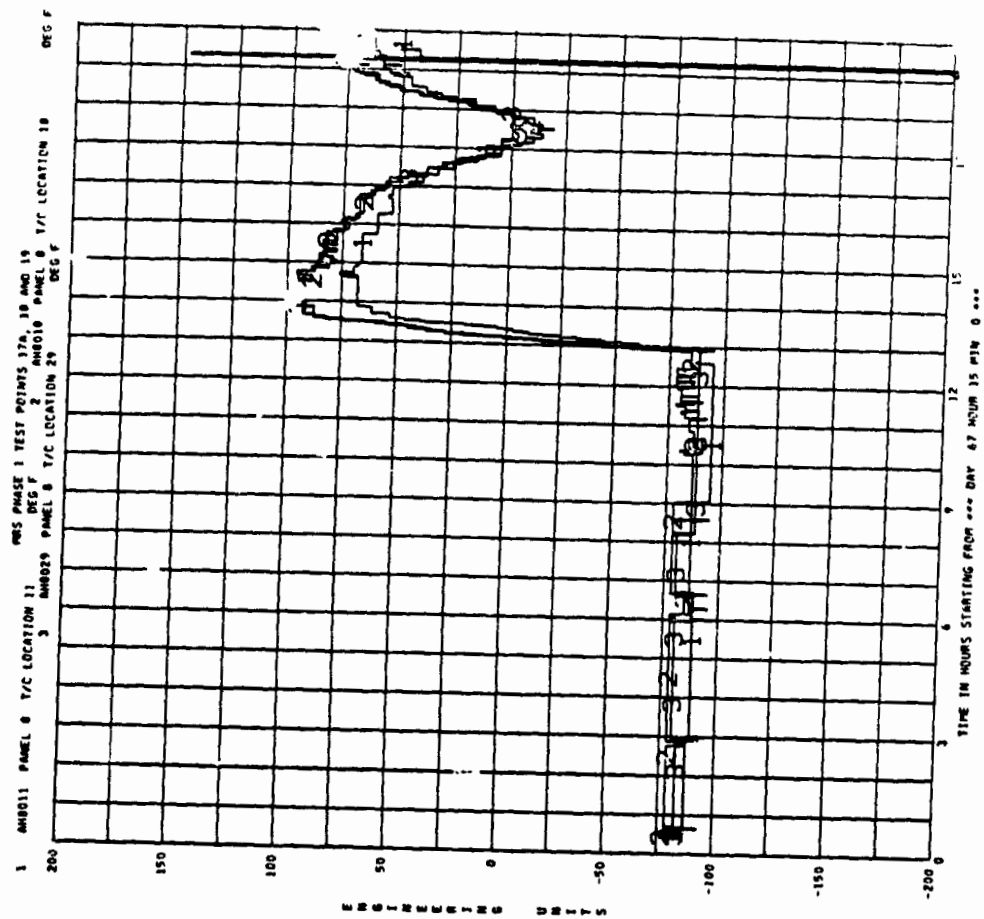
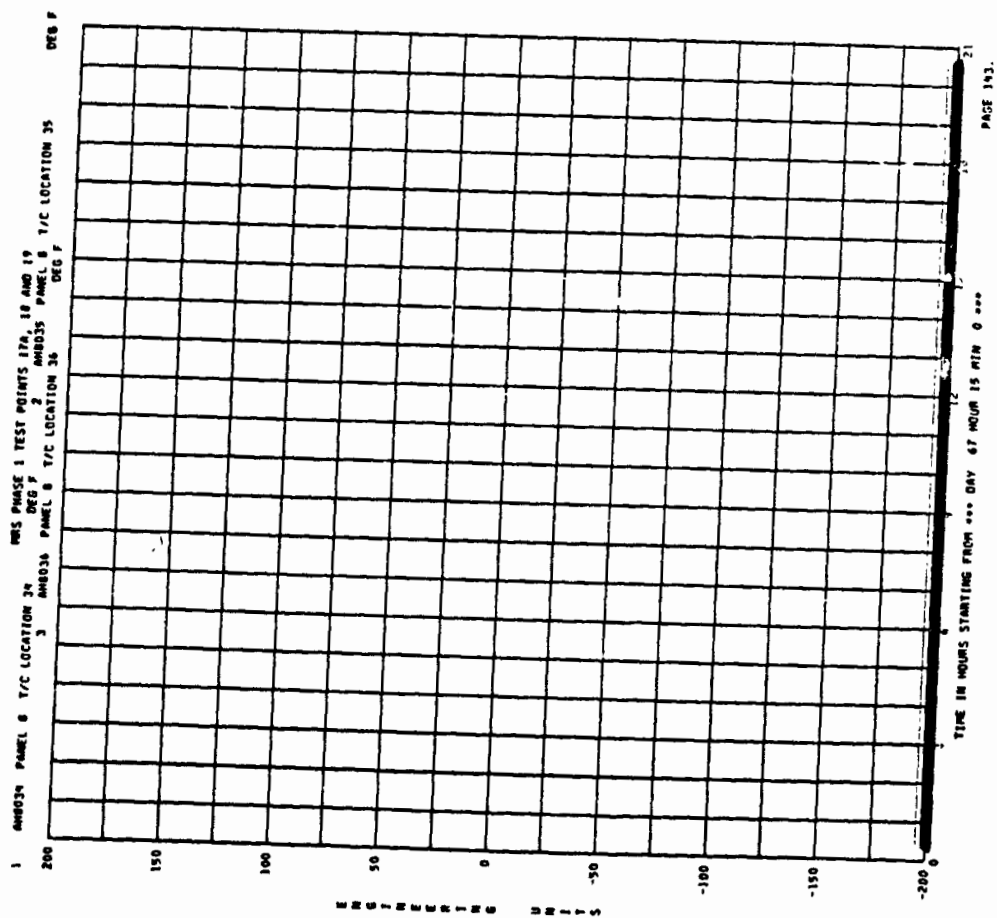










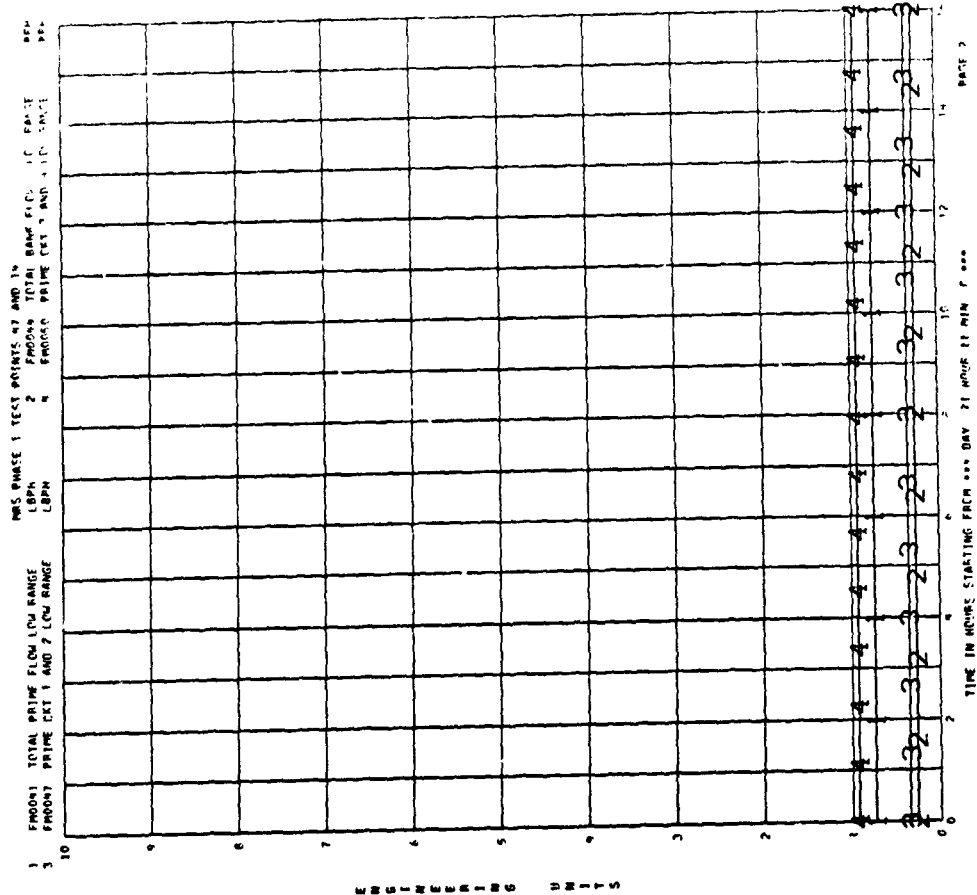
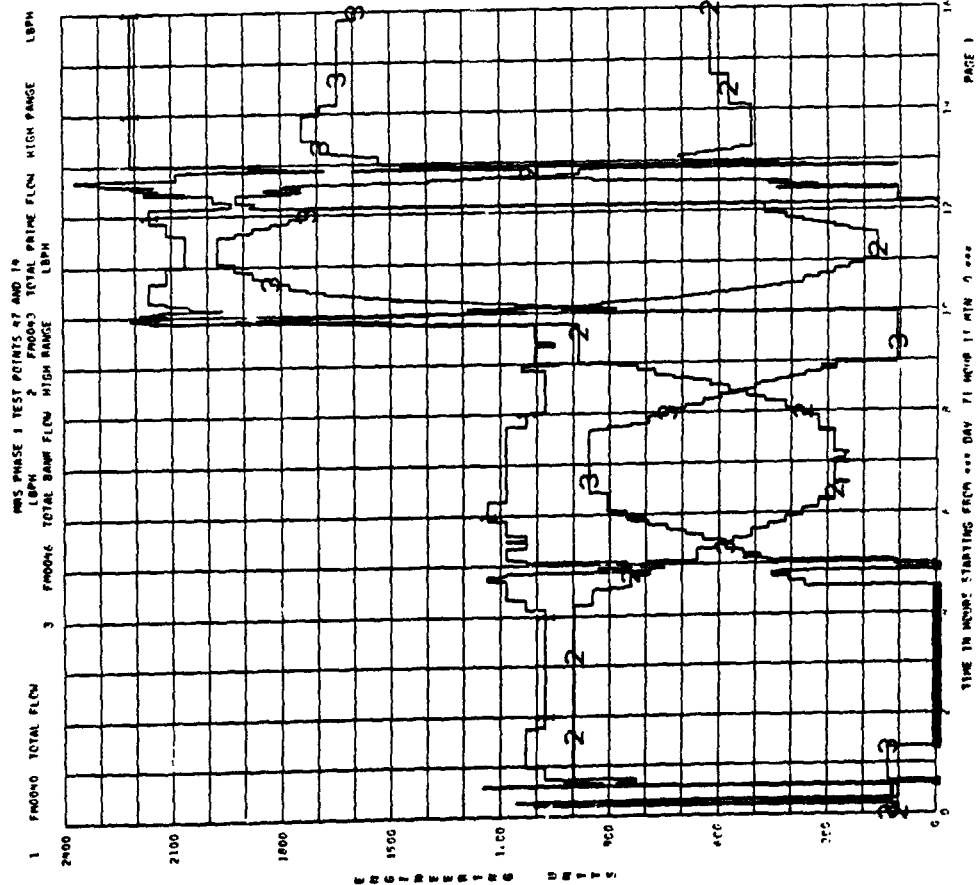


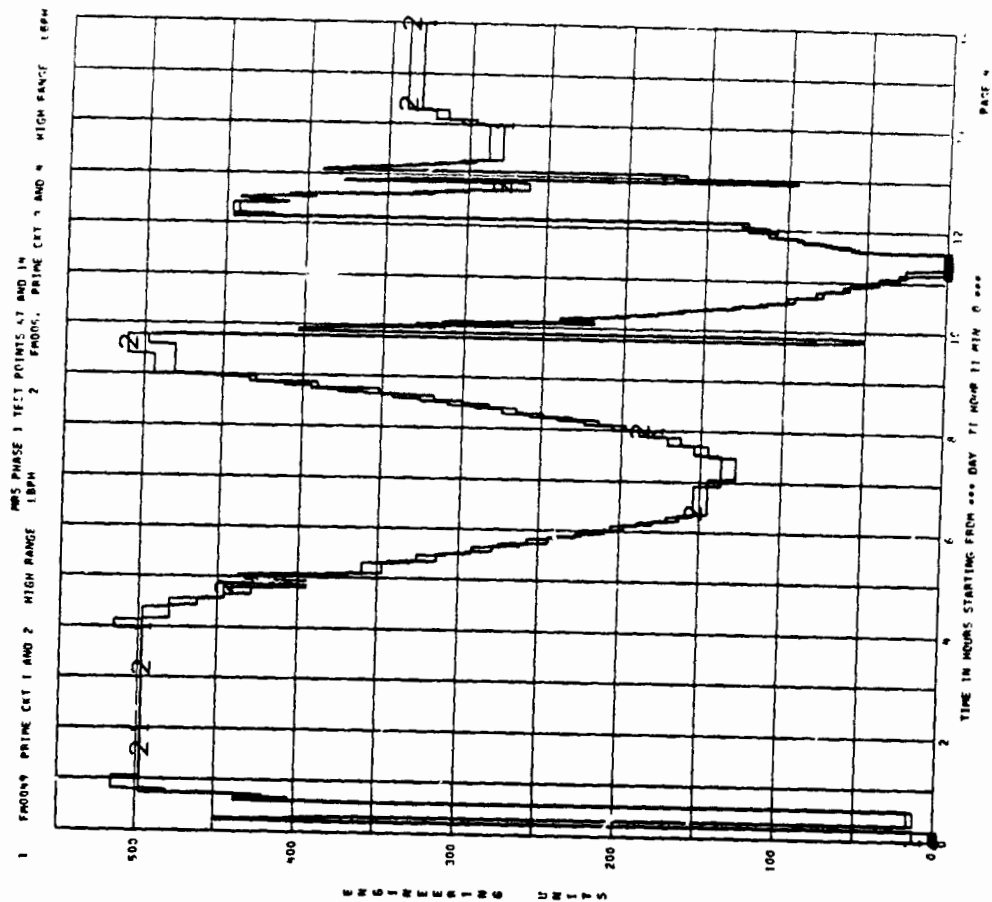
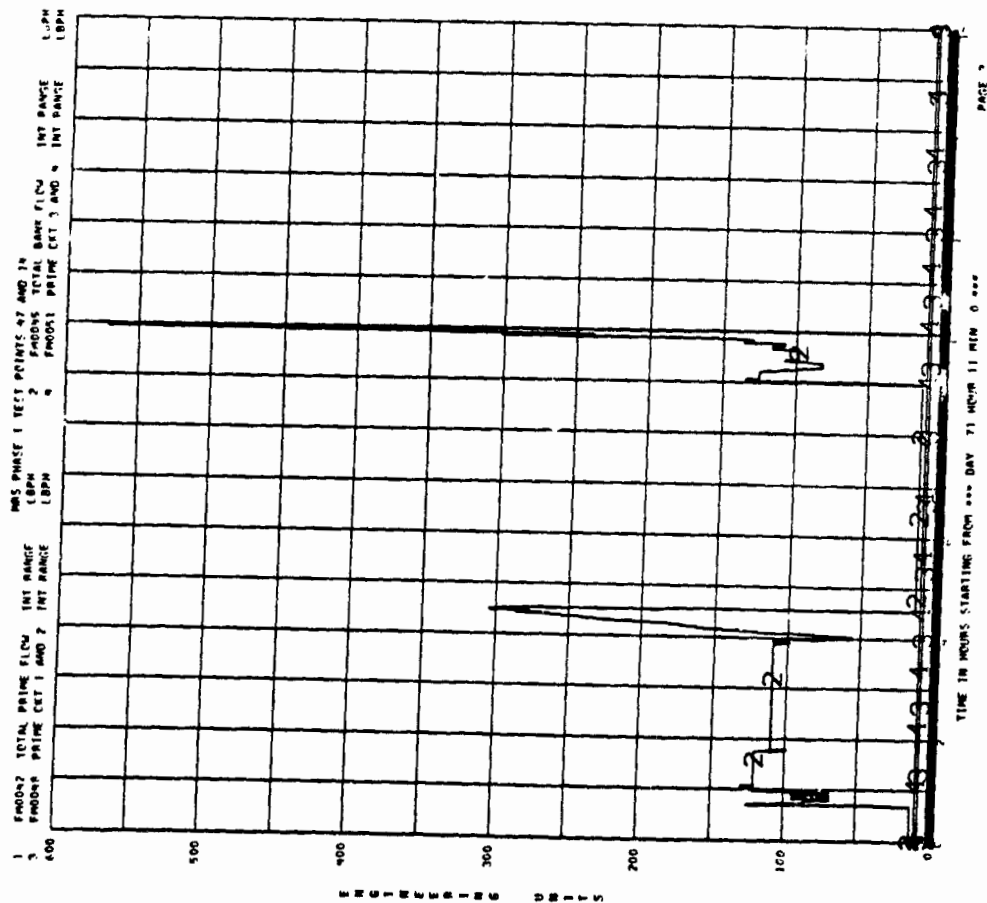
TEST GROUP D

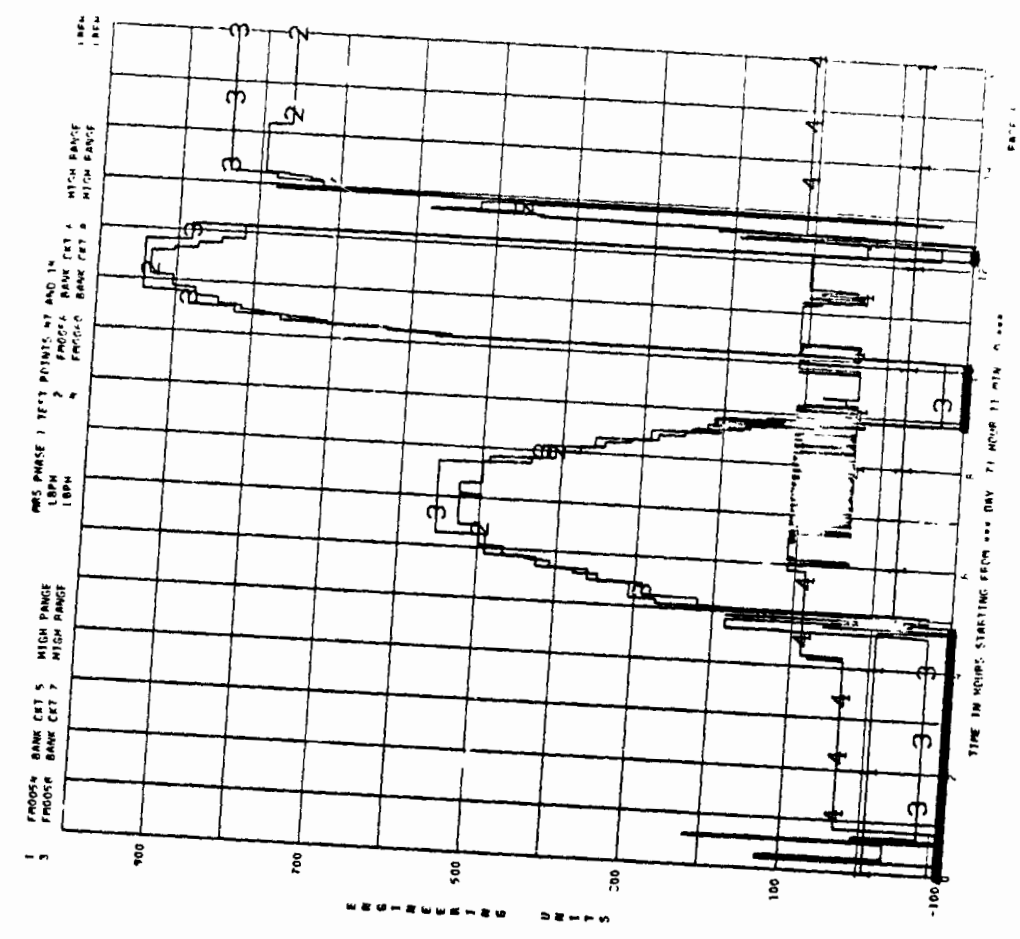
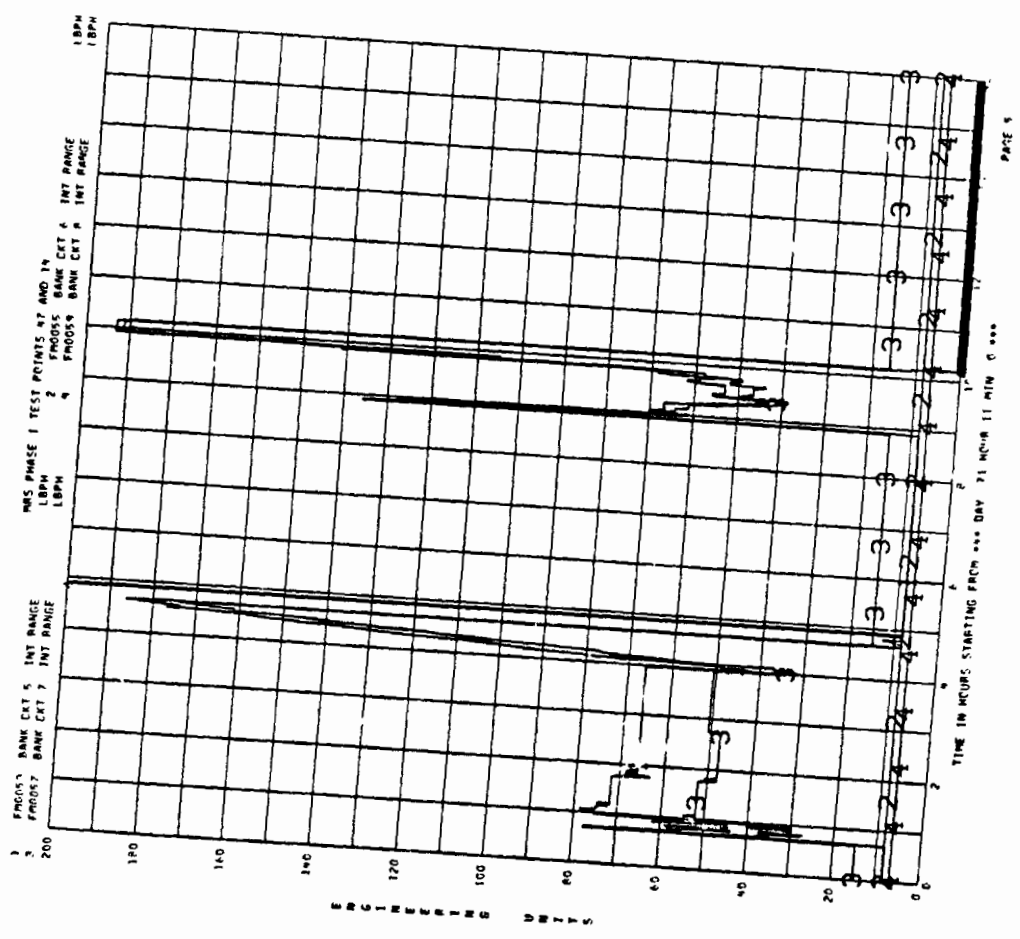
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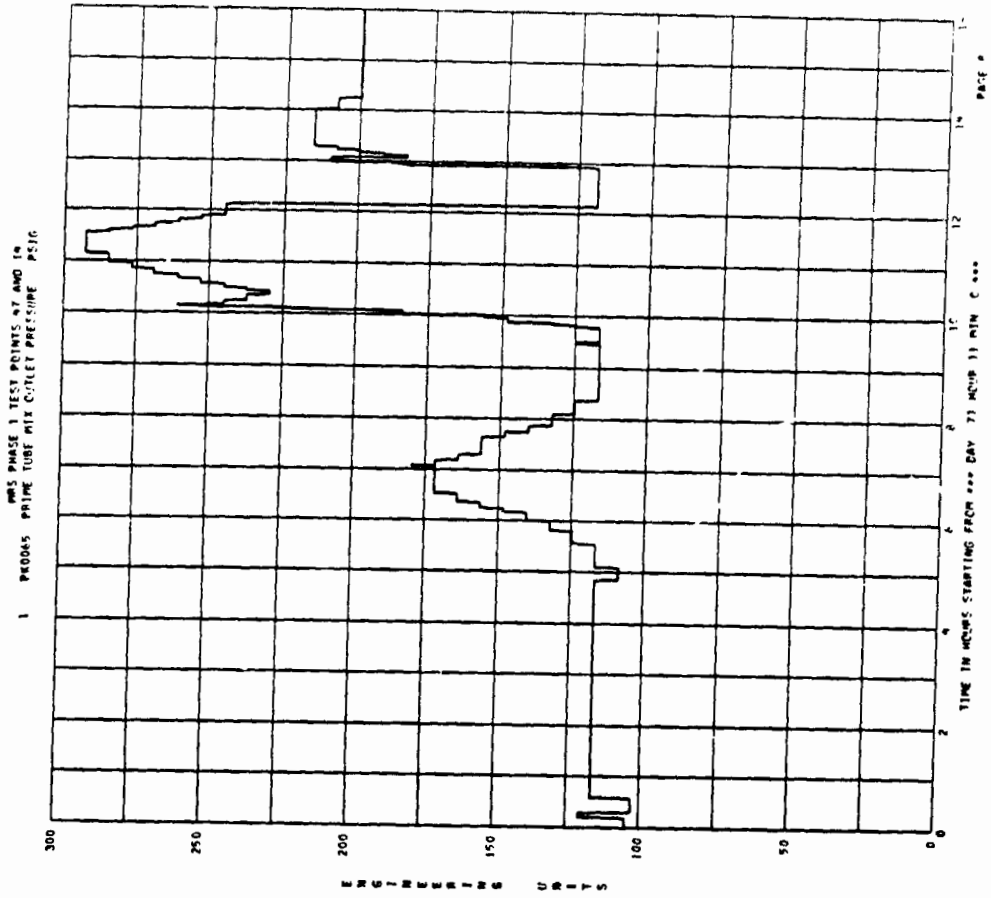
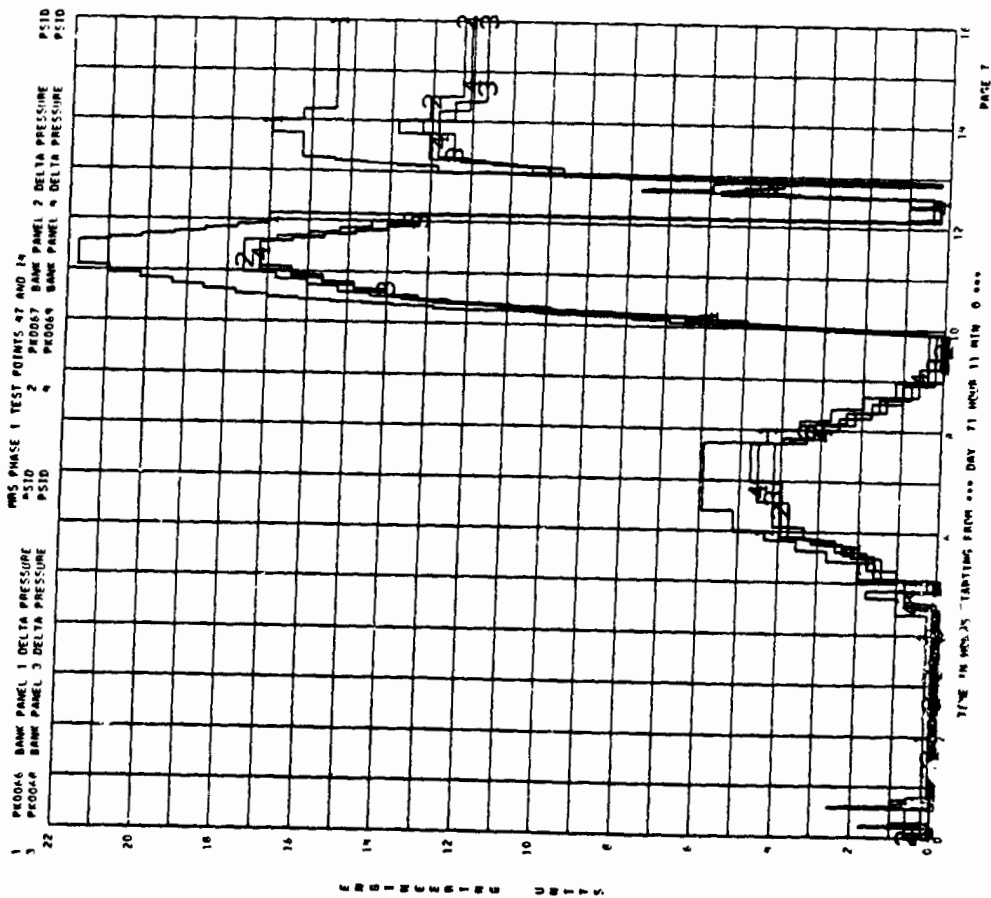
INCLUDES TEST POINTS

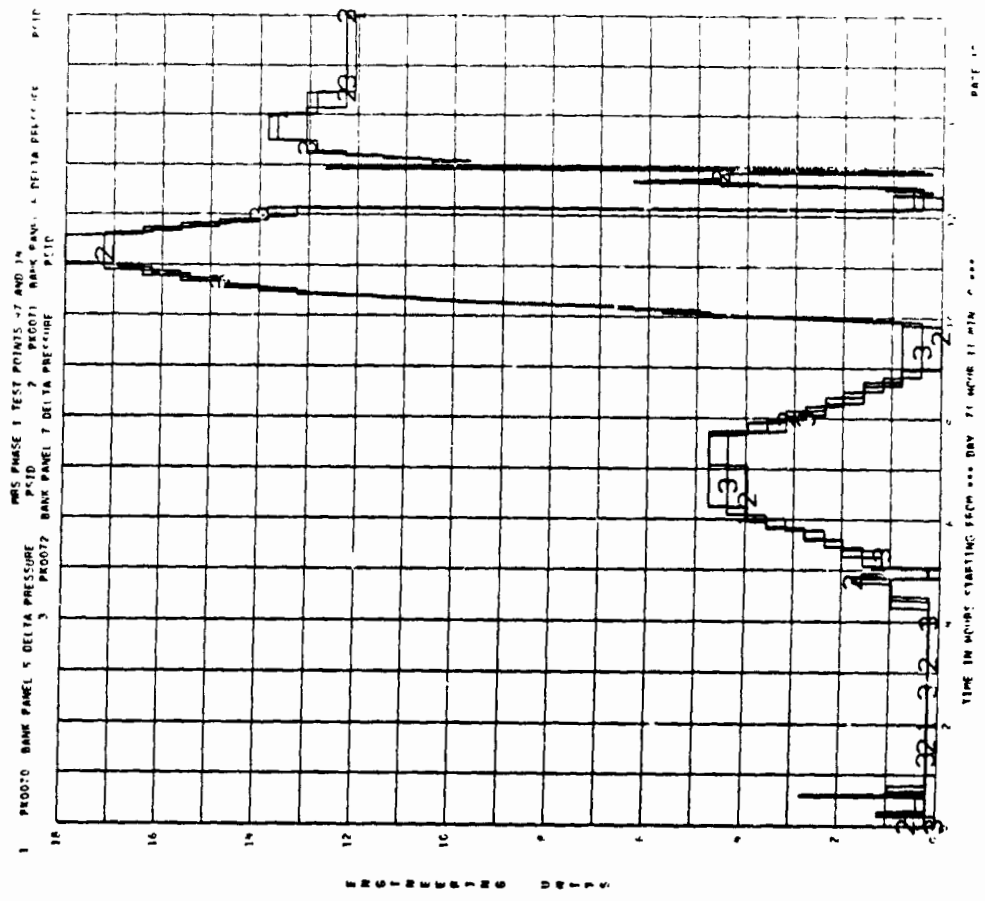
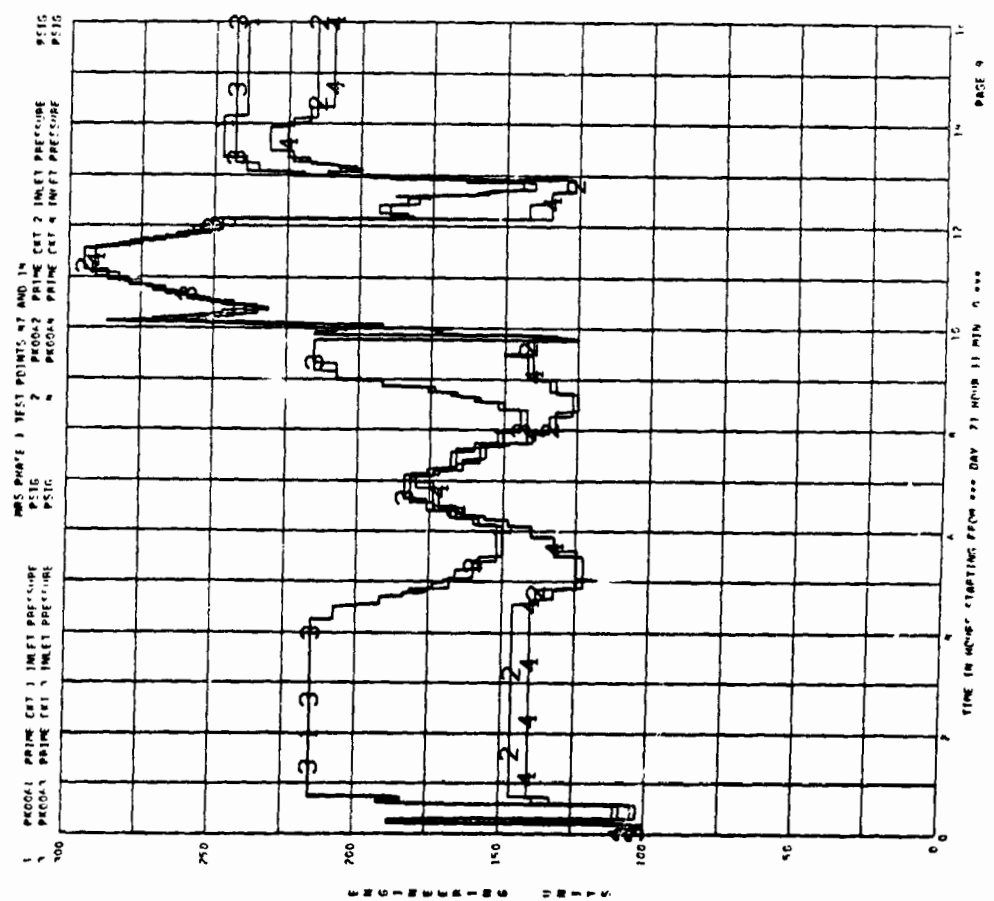
47
14



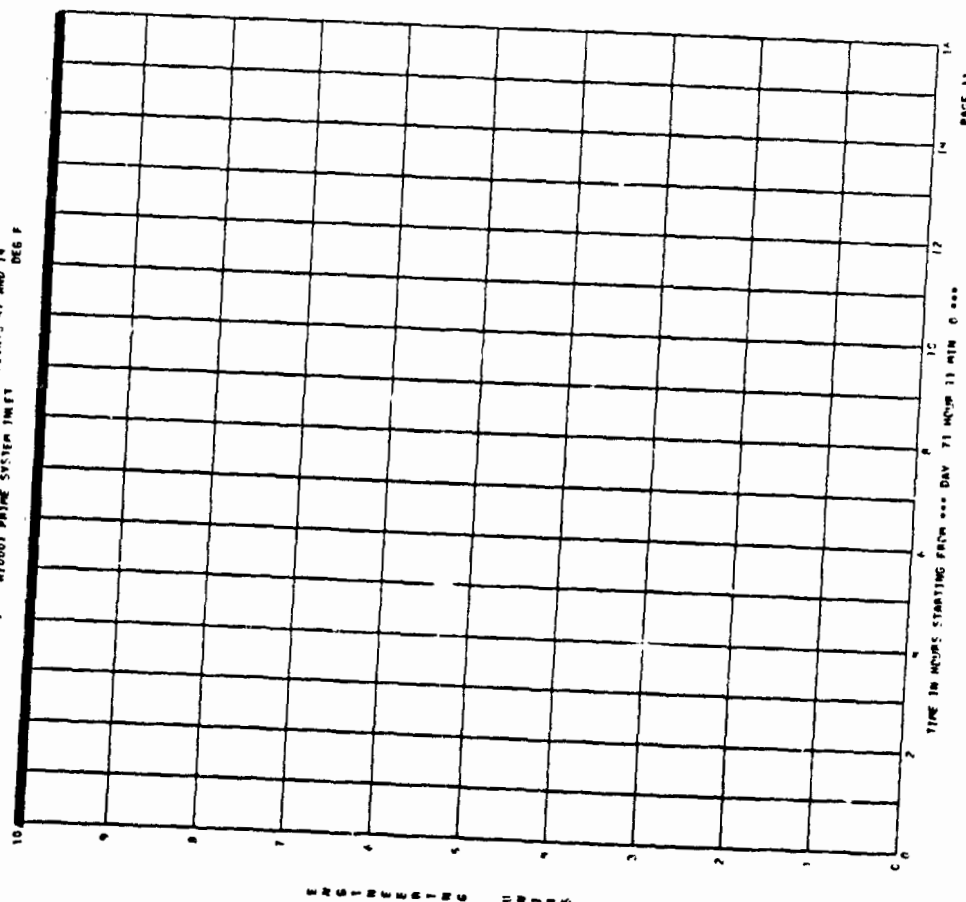






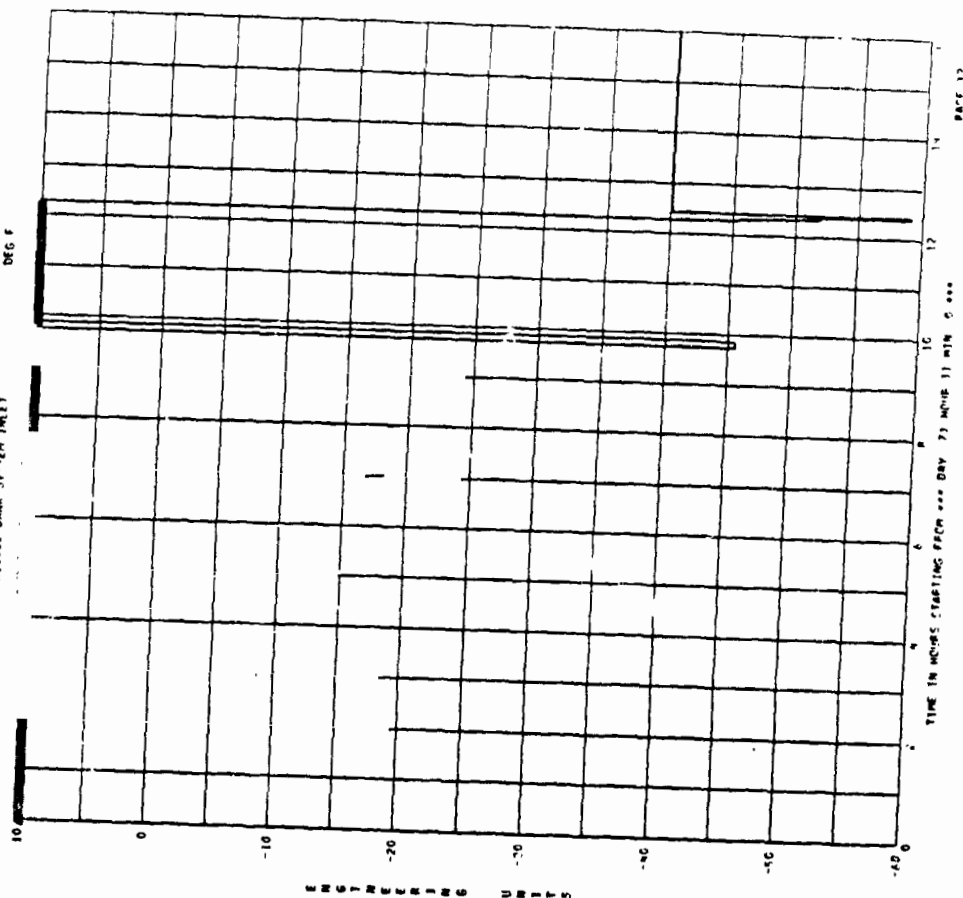


1 AT0003 PRIME SYSTEM INLET
MMS PHASE 1 TEST POINTS #7 AND 14
DEG F



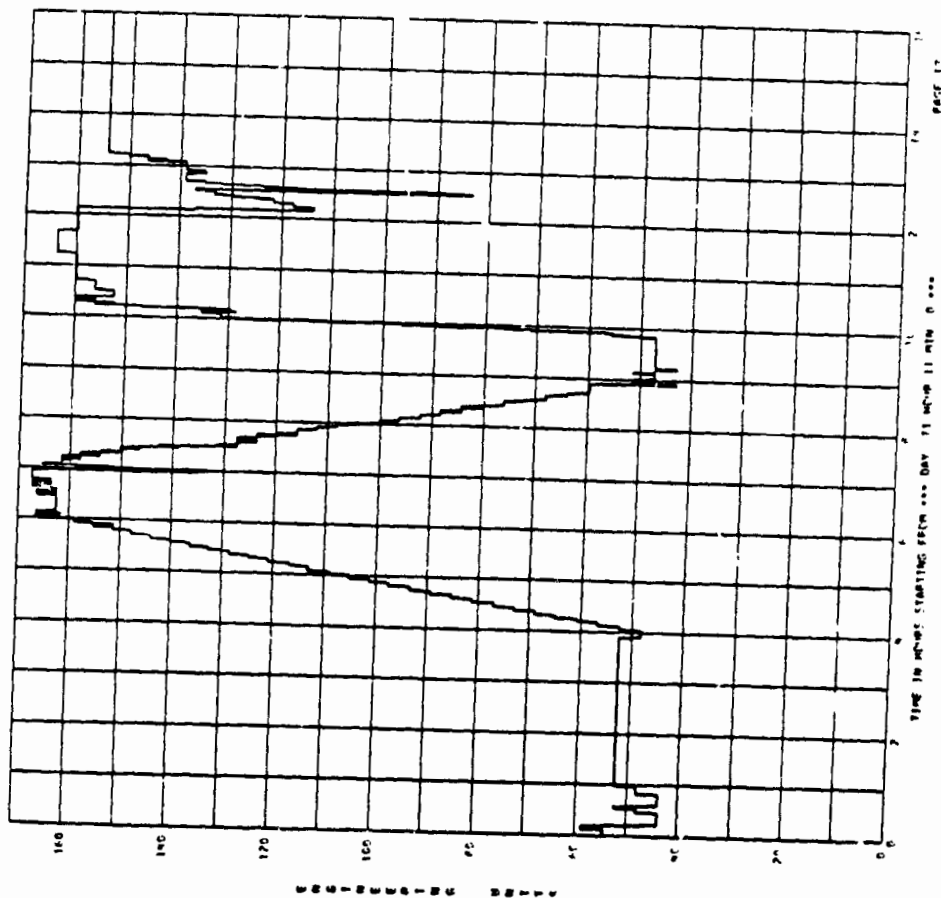
PAGE 11

1 AT0002 BANK SYSTEM INLET
MMS PHASE 1 TEST POINTS #7 AND 14
DEG F



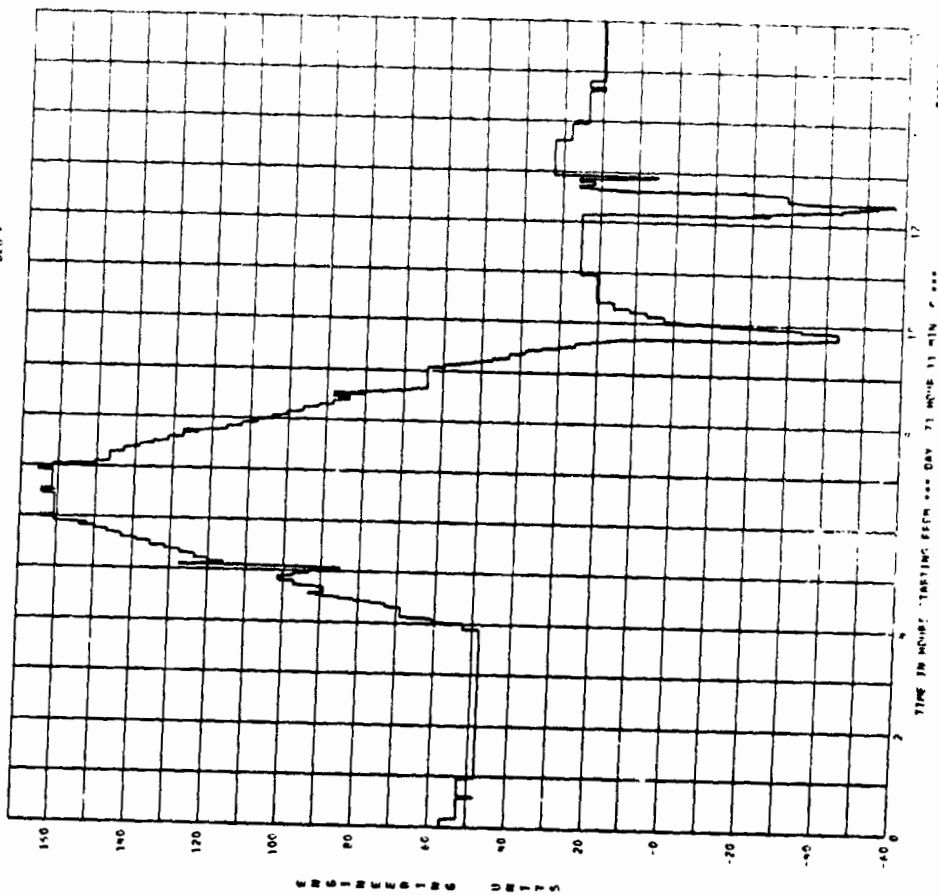
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PHASE 1 TEST POINTS 47 AND 14
 1 AJ0001 PRIME SYSTEM INLET DEG F



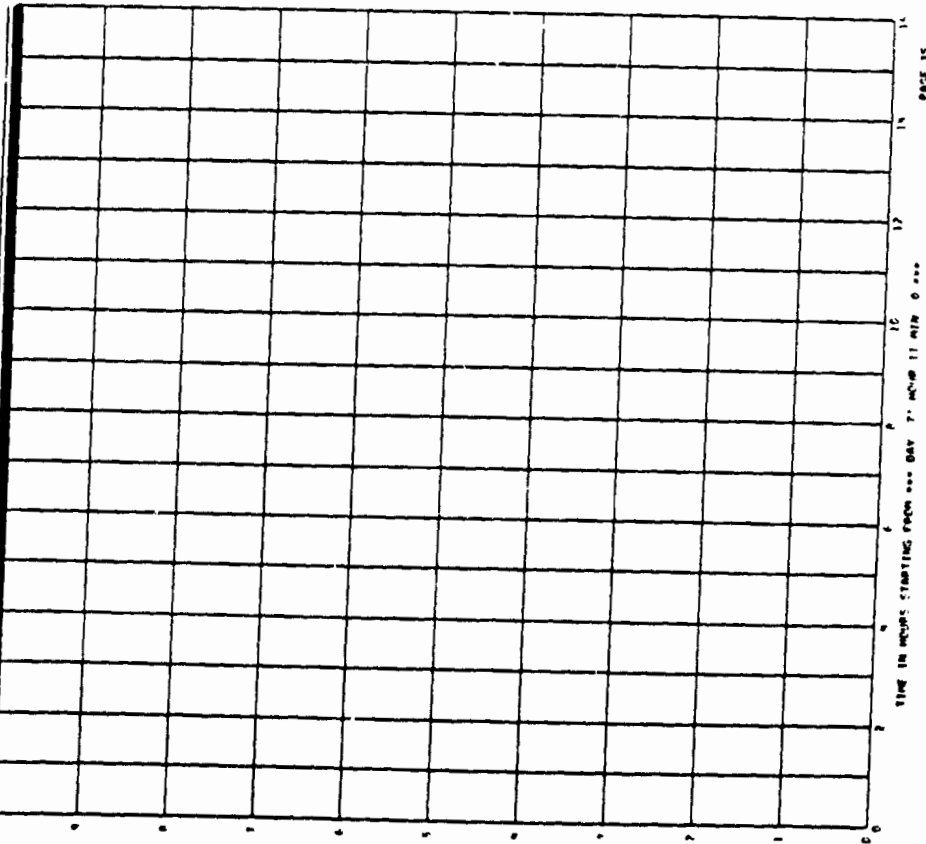
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PHASE 1 TEST POINTS 47 AND 14
 1 AJ0002 BANK SYSTEM INLET DEG F



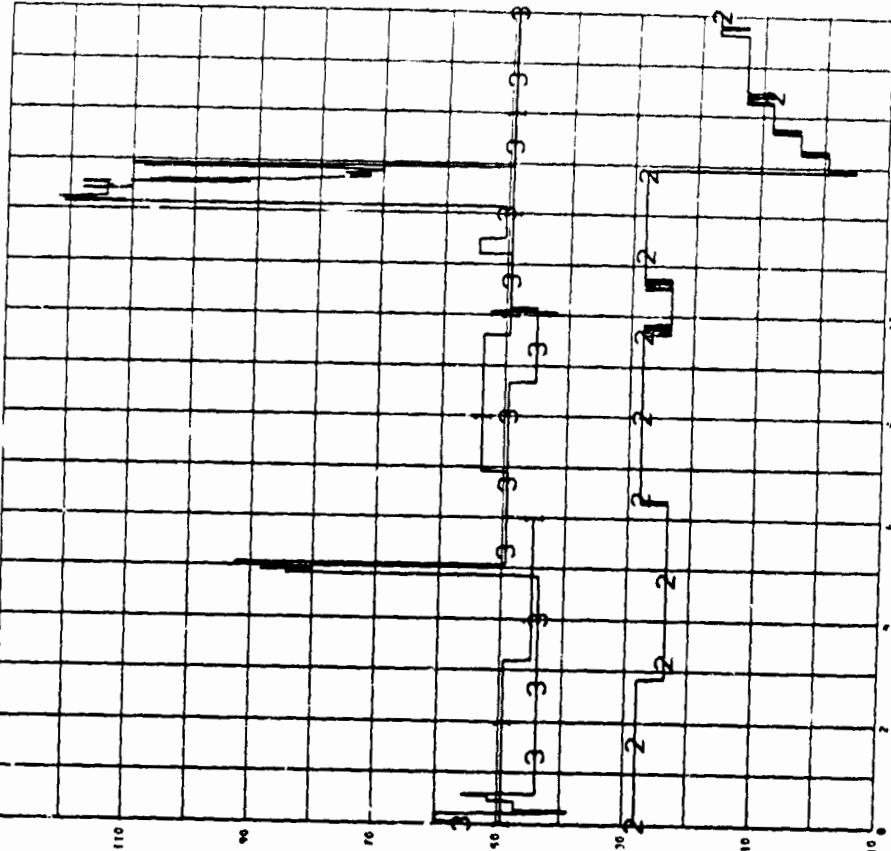
PAGE 18

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 2. A10019 PRIME TIMES OUTLET MIX IN CM DEG F
 3. A10019 PRIME TIMES OUTLET MIX IN CM DEG F
 4. A10019 PRIME TIMES OUTLET MIX IN CM DEG F
 5. A10019 PRIME TIMES OUTLET MIX IN CM DEG F
 6. A10019 PRIME TIMES OUTLET MIX IN CM DEG F
 7. A10019 PRIME TIMES OUTLET MIX IN CM DEG F
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 10. A10019 PRIME TIMES OUTLET MIX IN CM DEG F

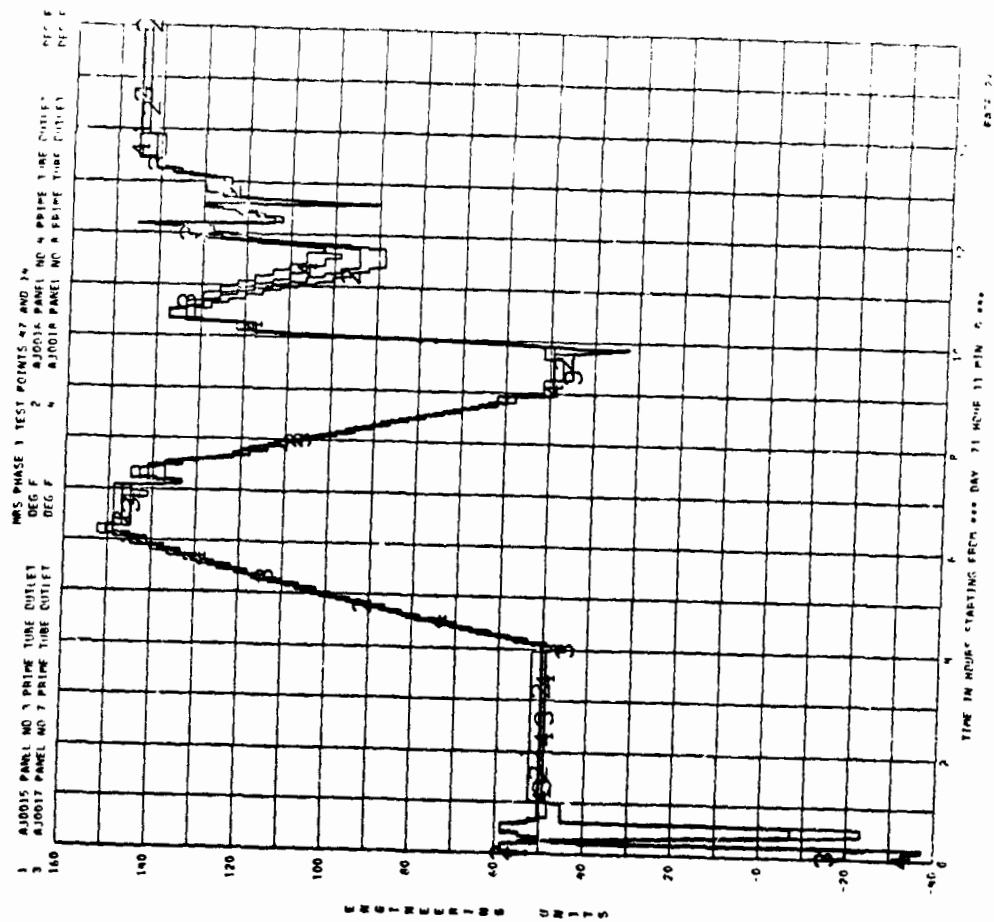
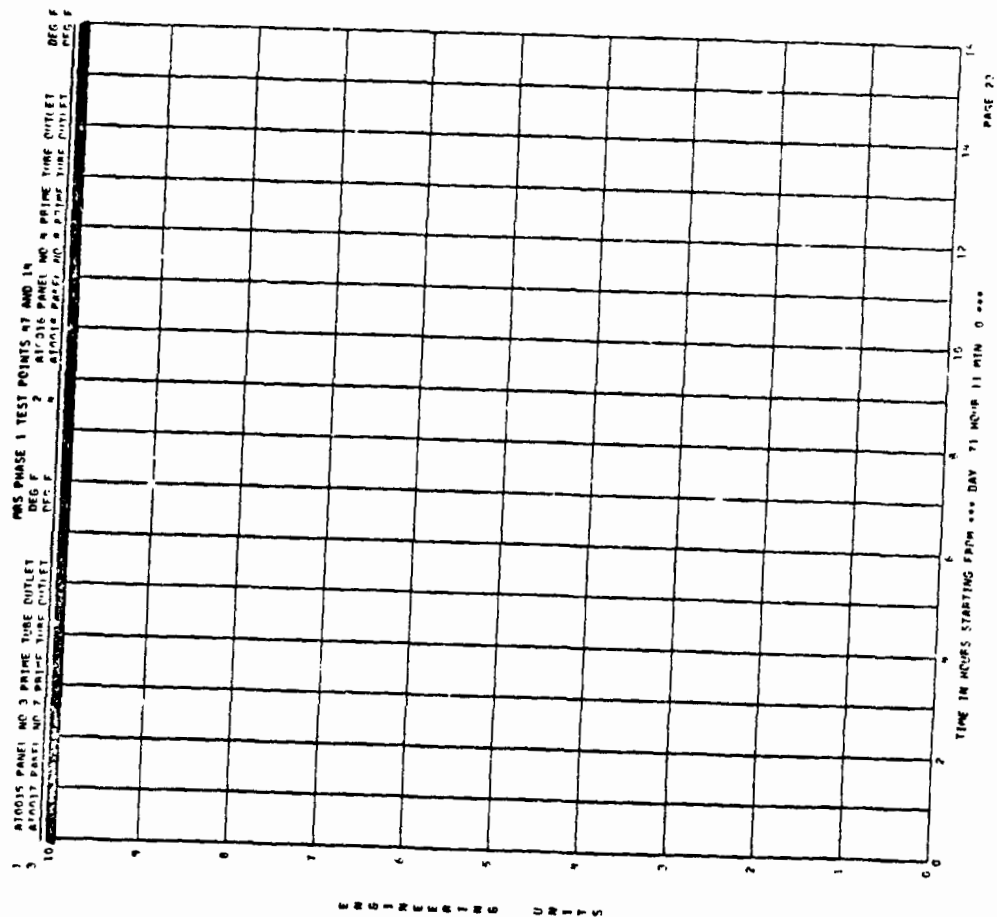


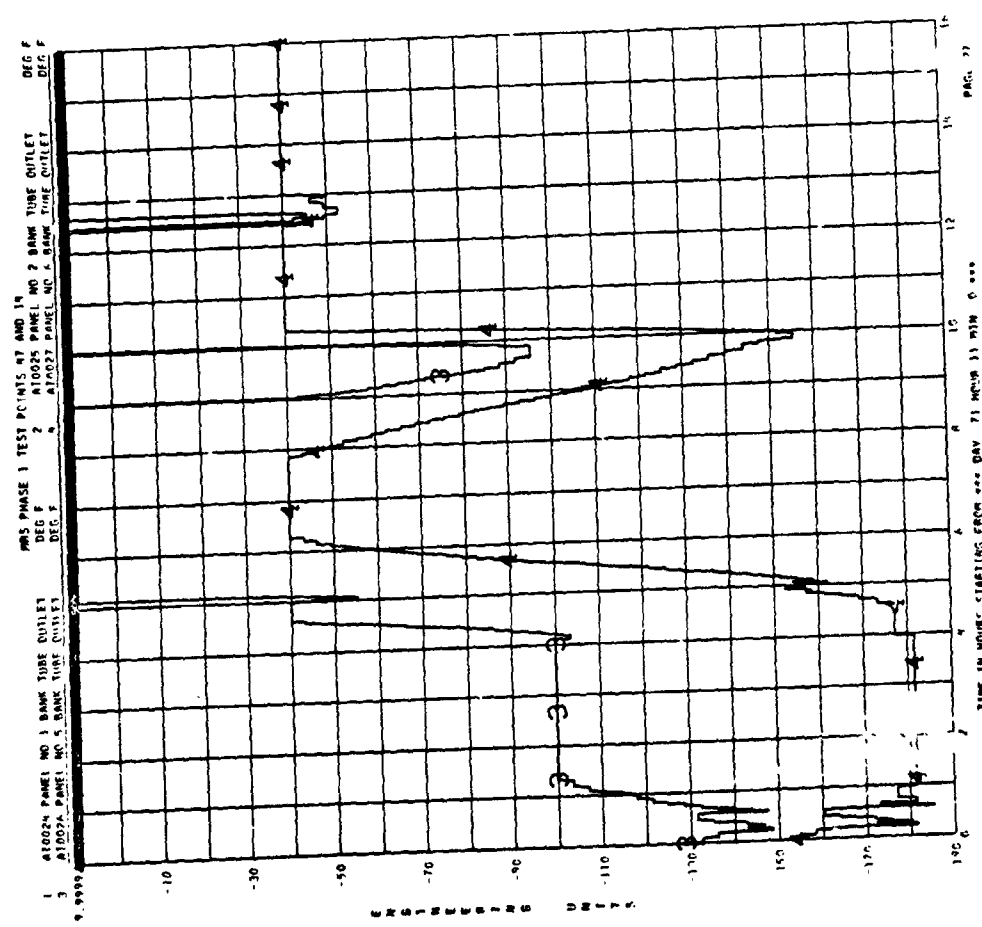
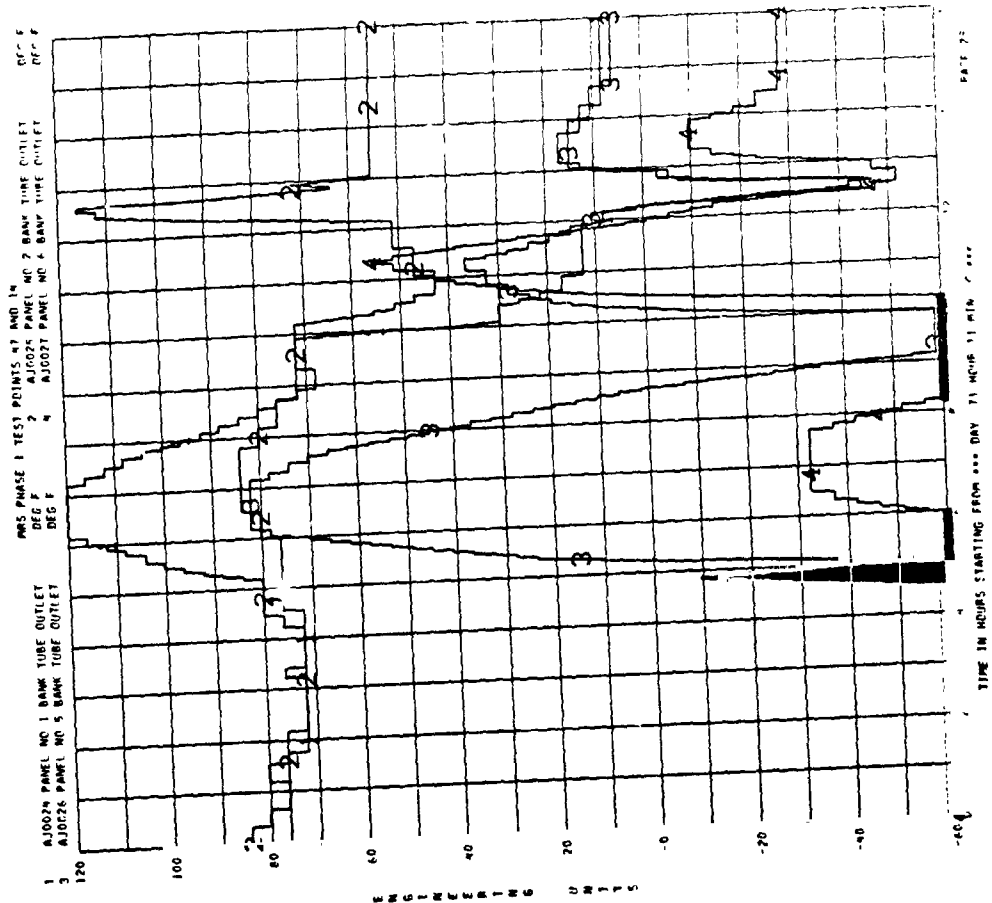
PAGE 14

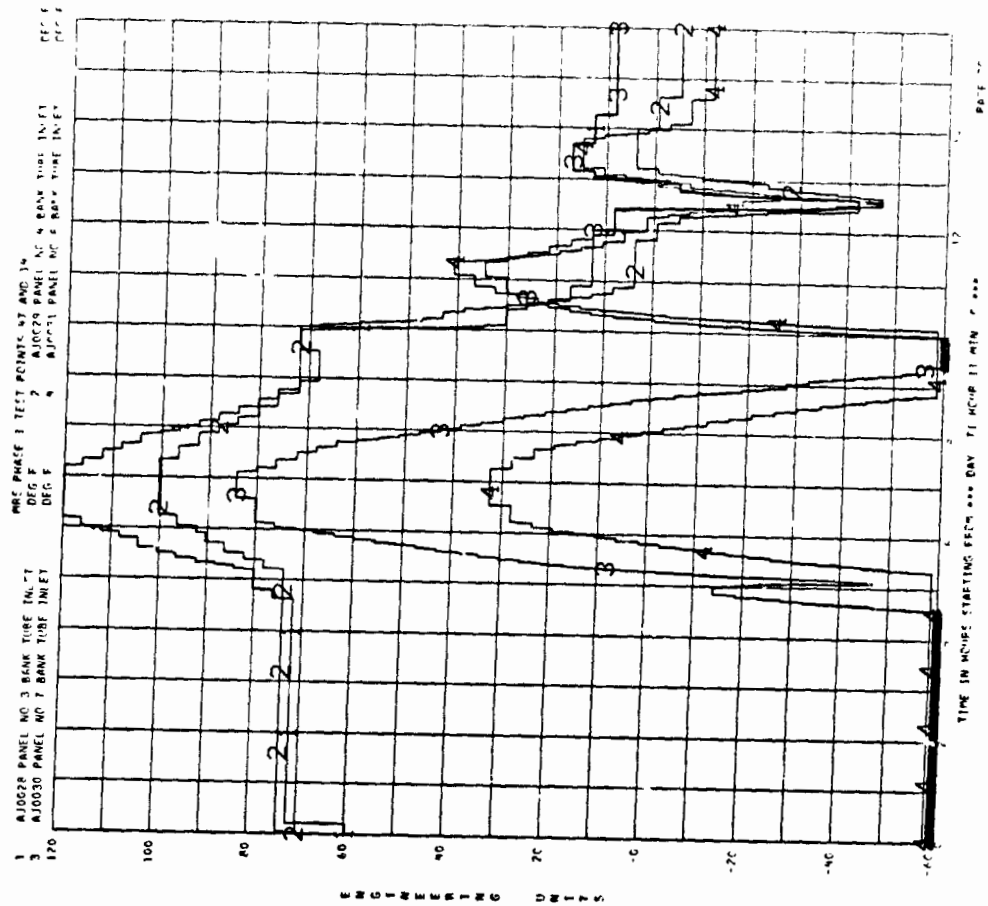
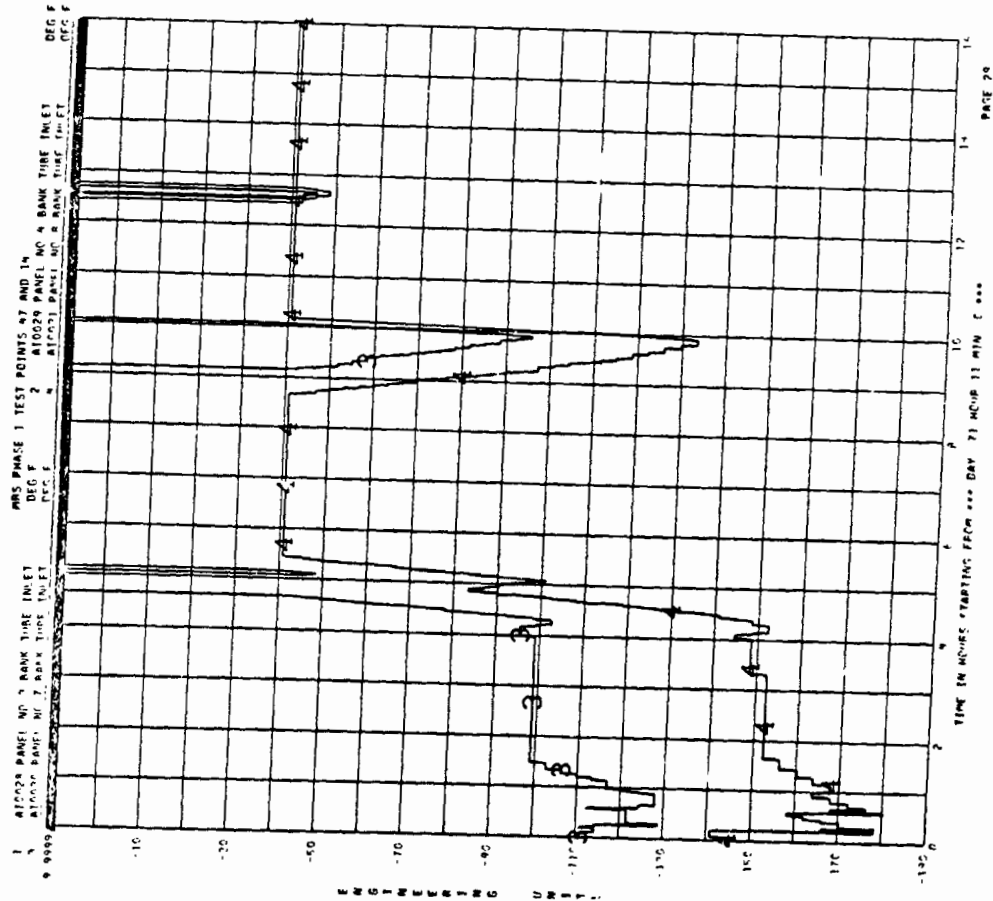
1. A10019 PRIME TIMES OUTLET MIX IN CM DEG F
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 4. A10019 PRIME TIMES OUTLET MIX IN CM DEG F
 5. A10019 PRIME TIMES OUTLET MIX IN CM DEG F
 6. A10019 PRIME TIMES OUTLET MIX IN CM DEG F
 7. A10019 PRIME TIMES OUTLET MIX IN CM DEG F
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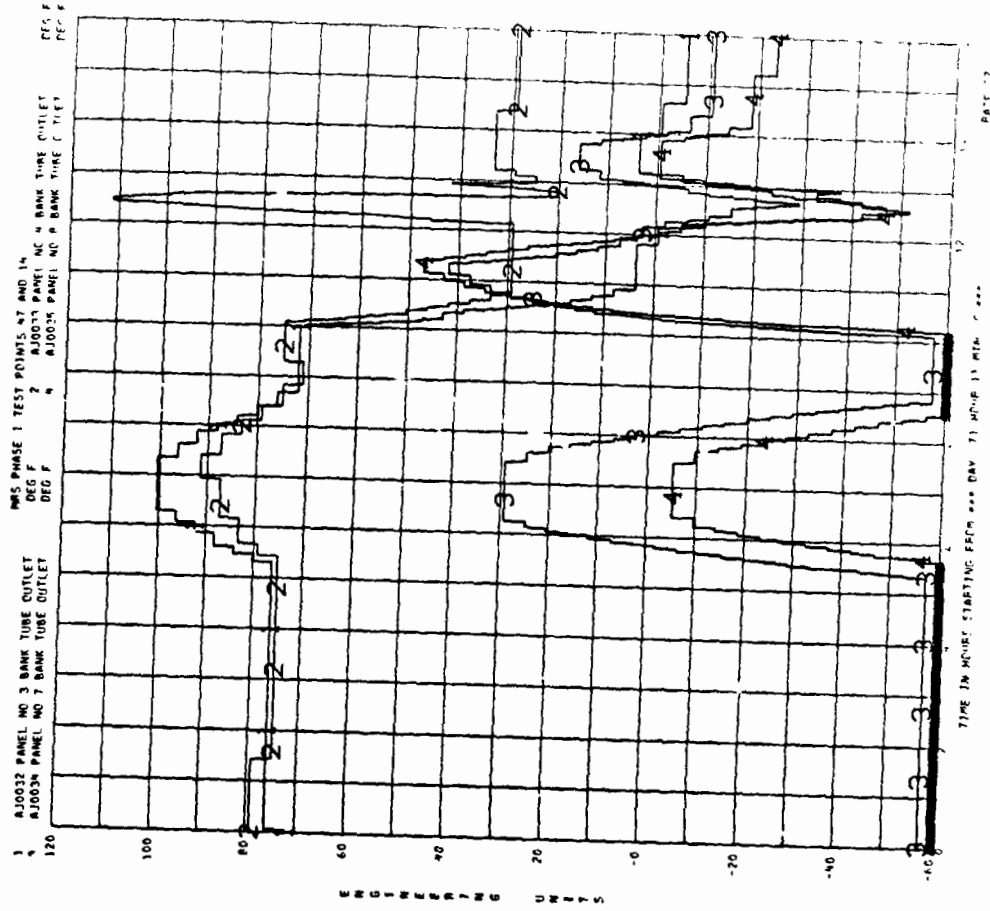
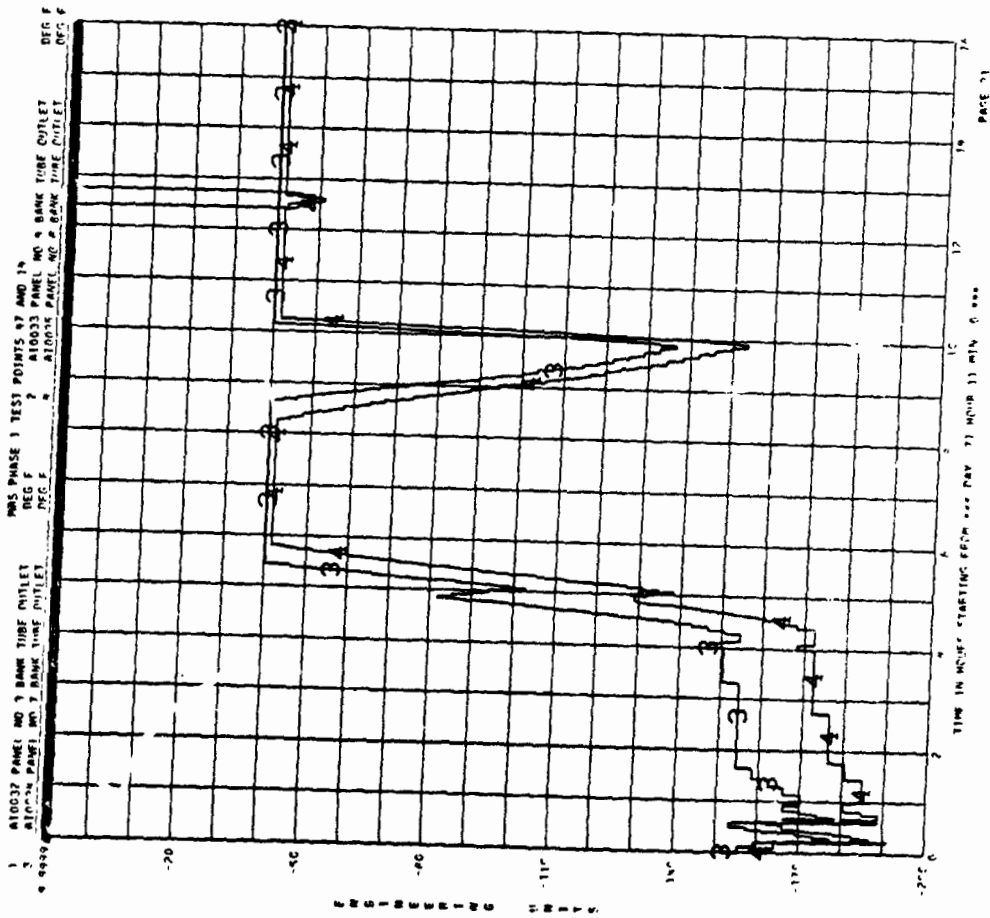


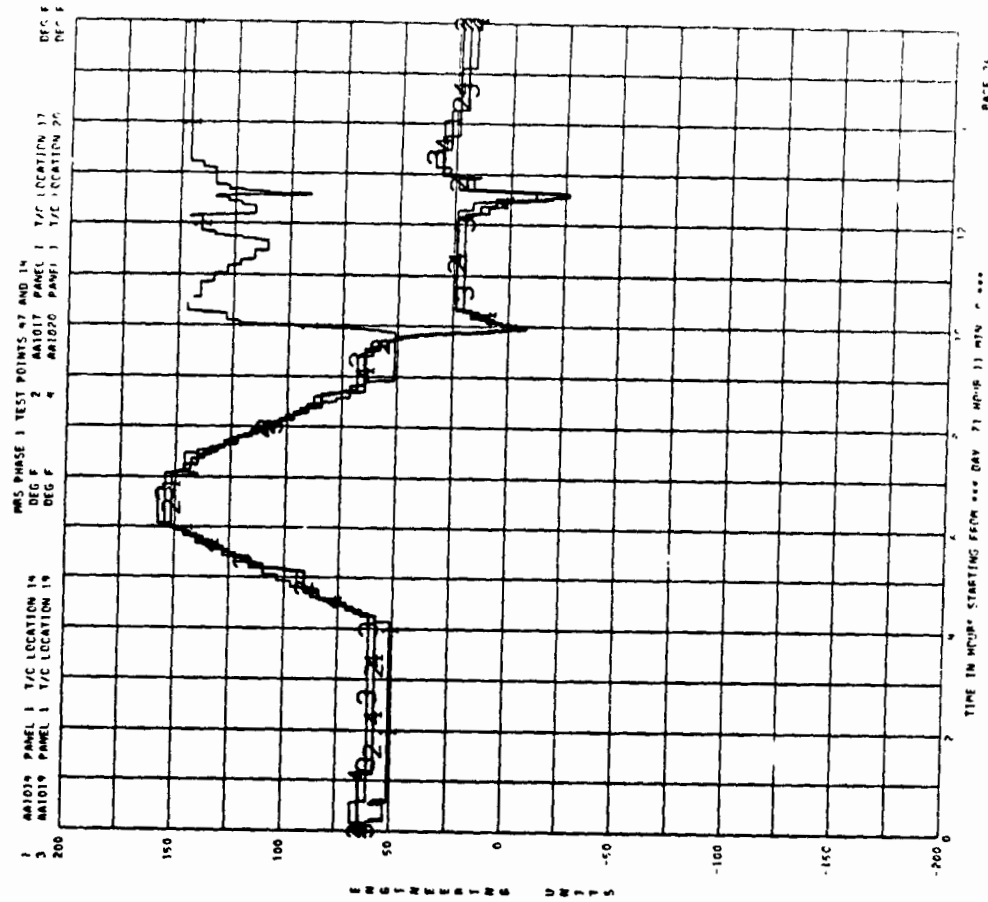
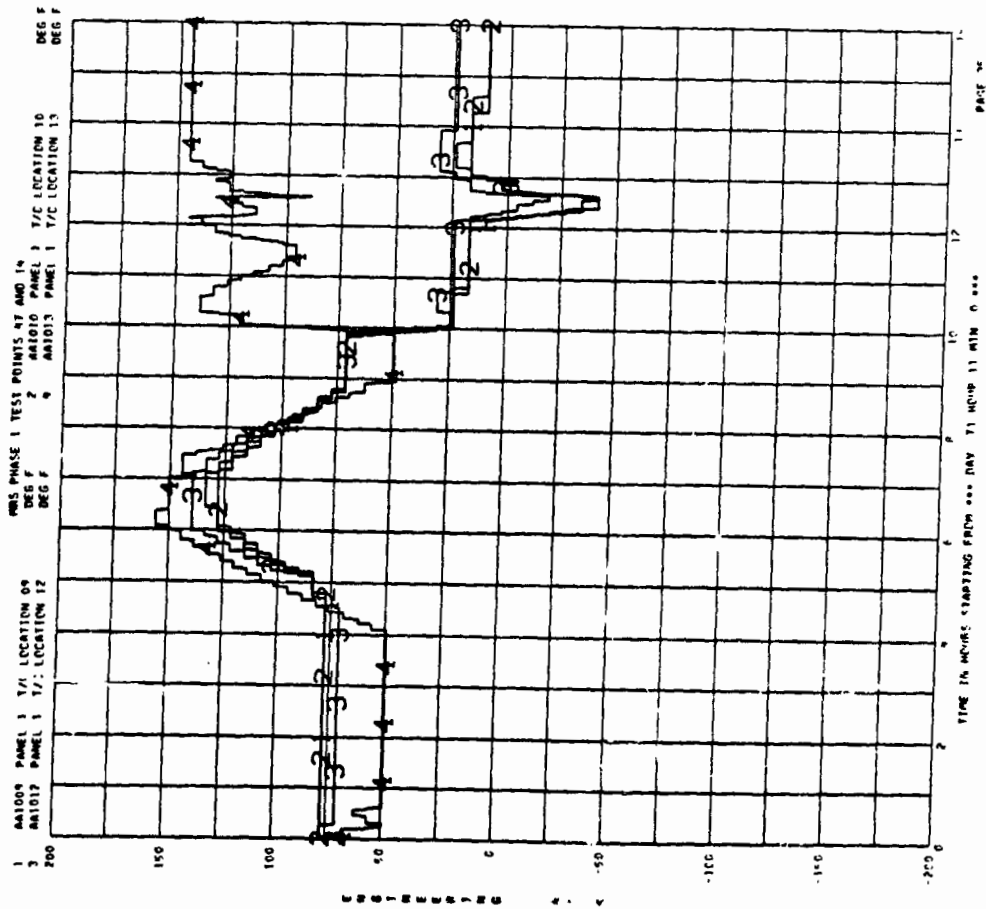
PAGE 15

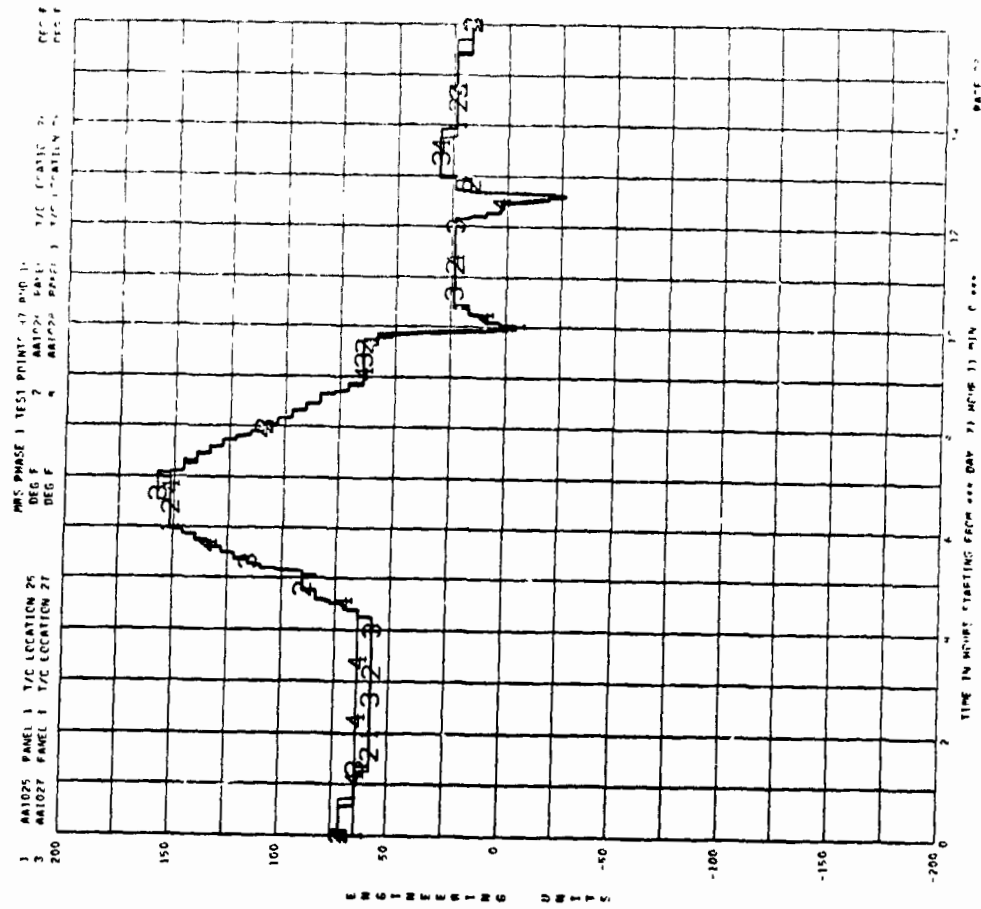
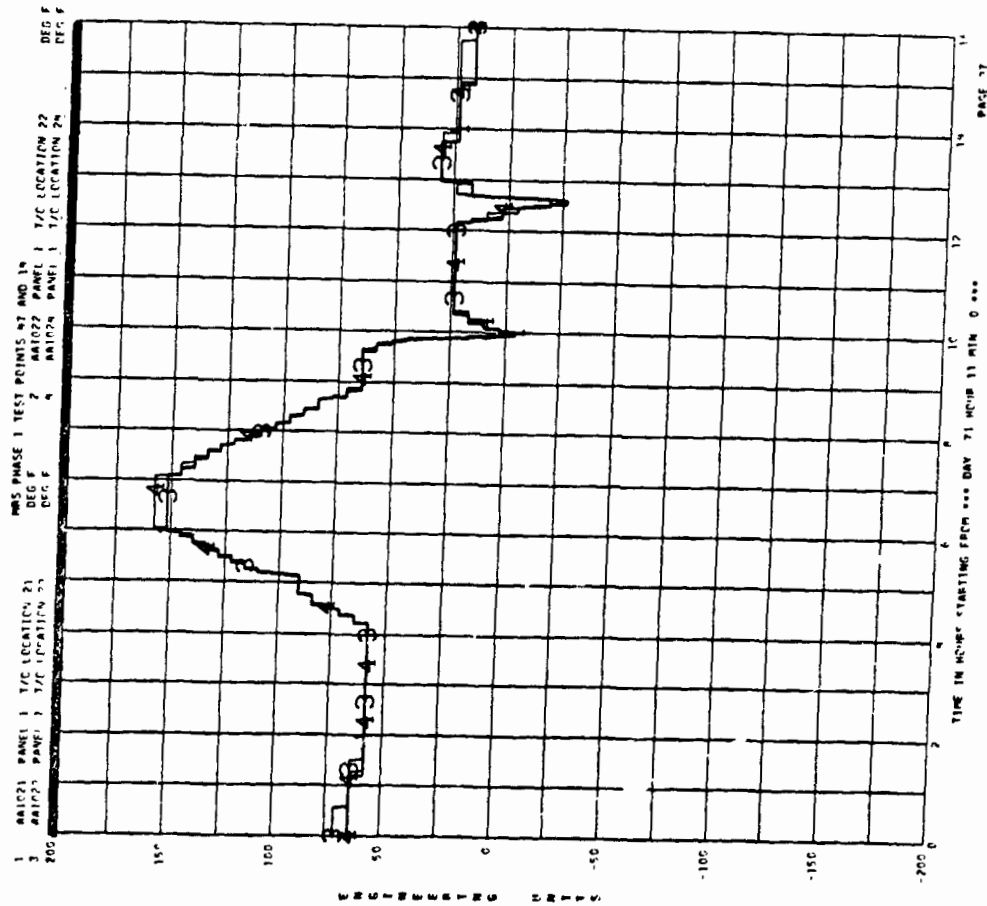


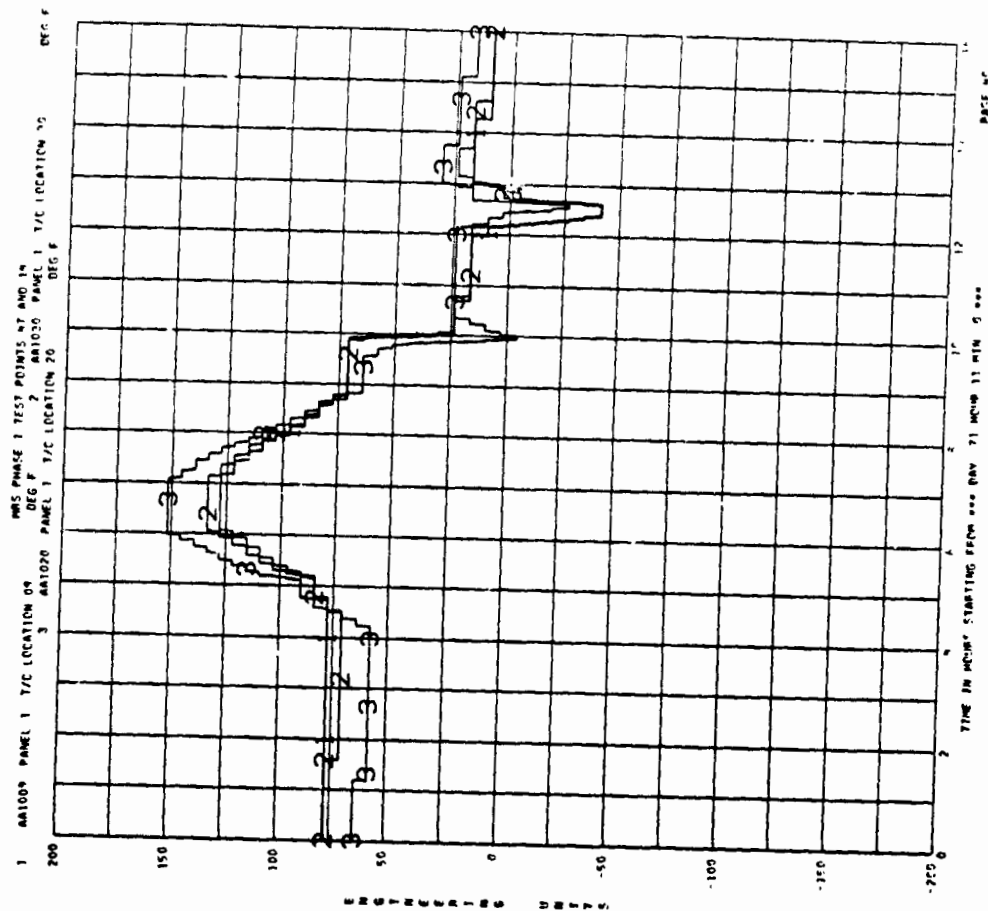
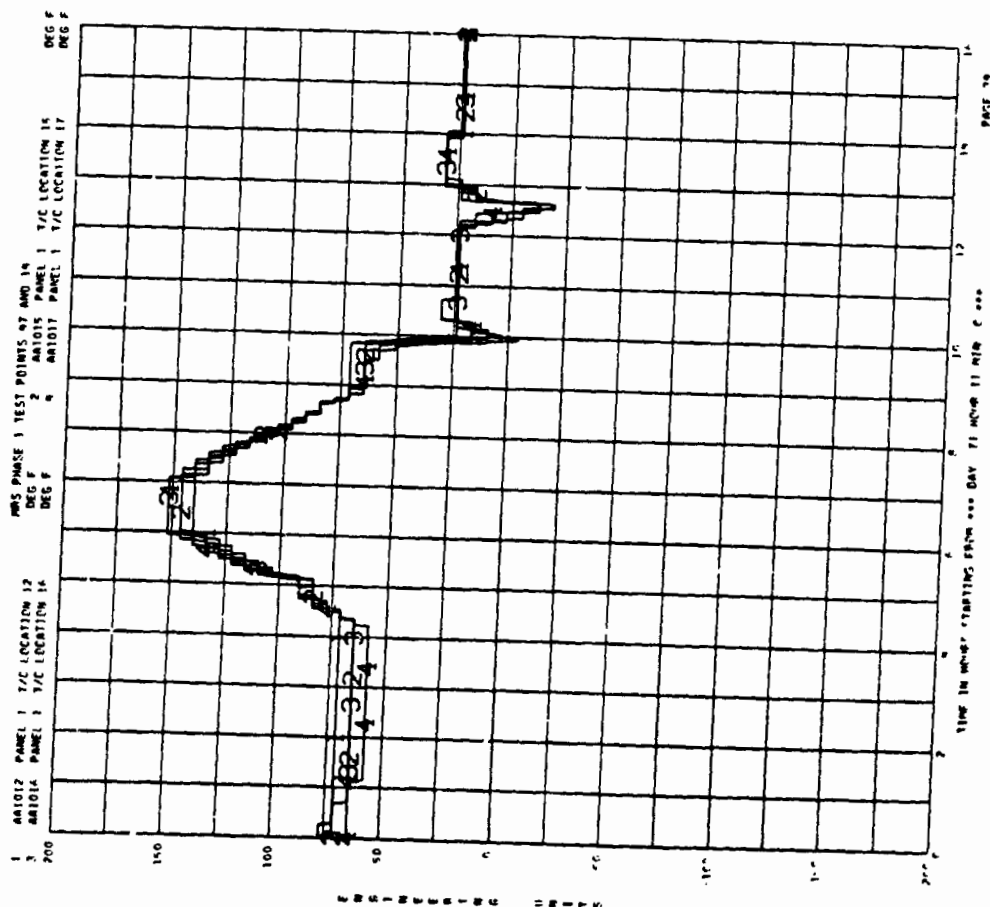


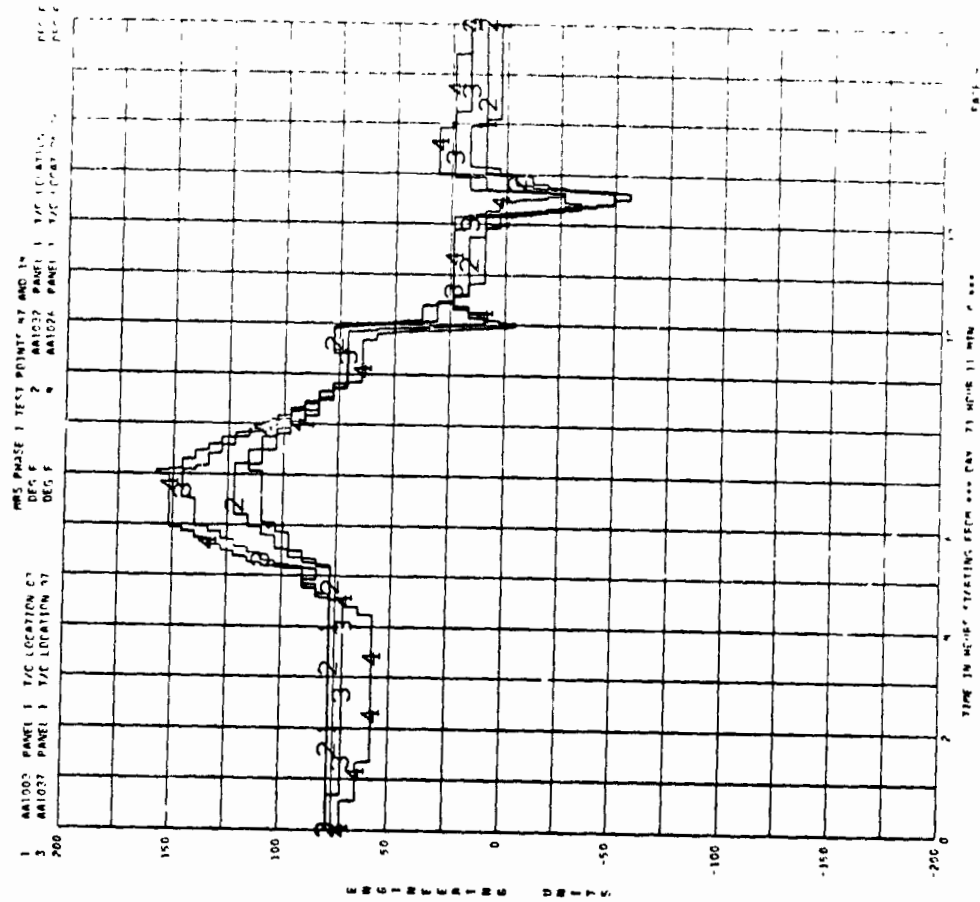
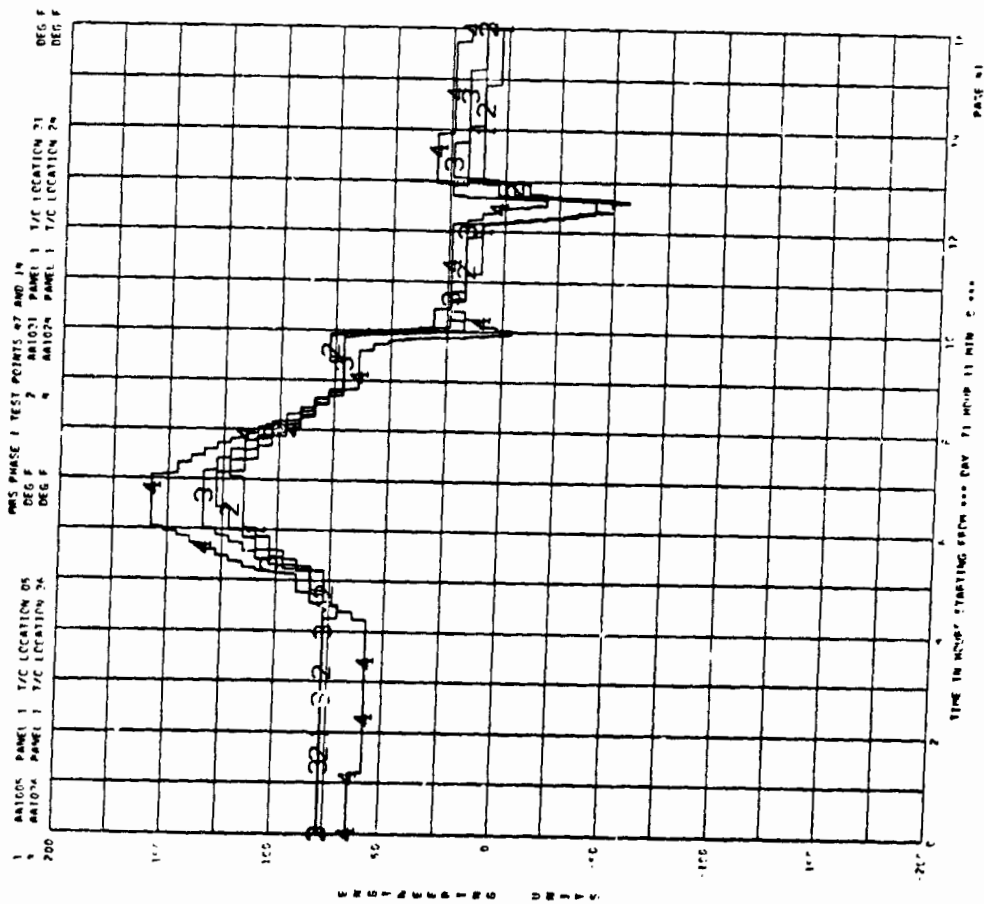


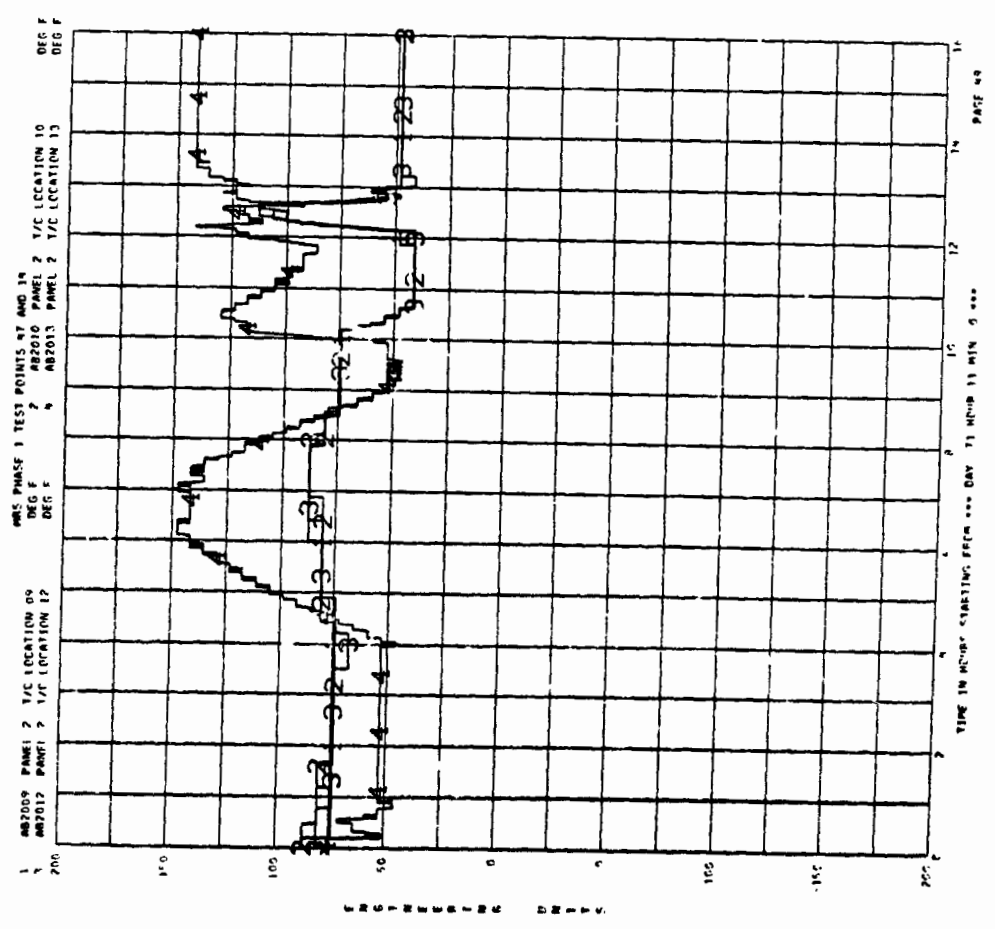
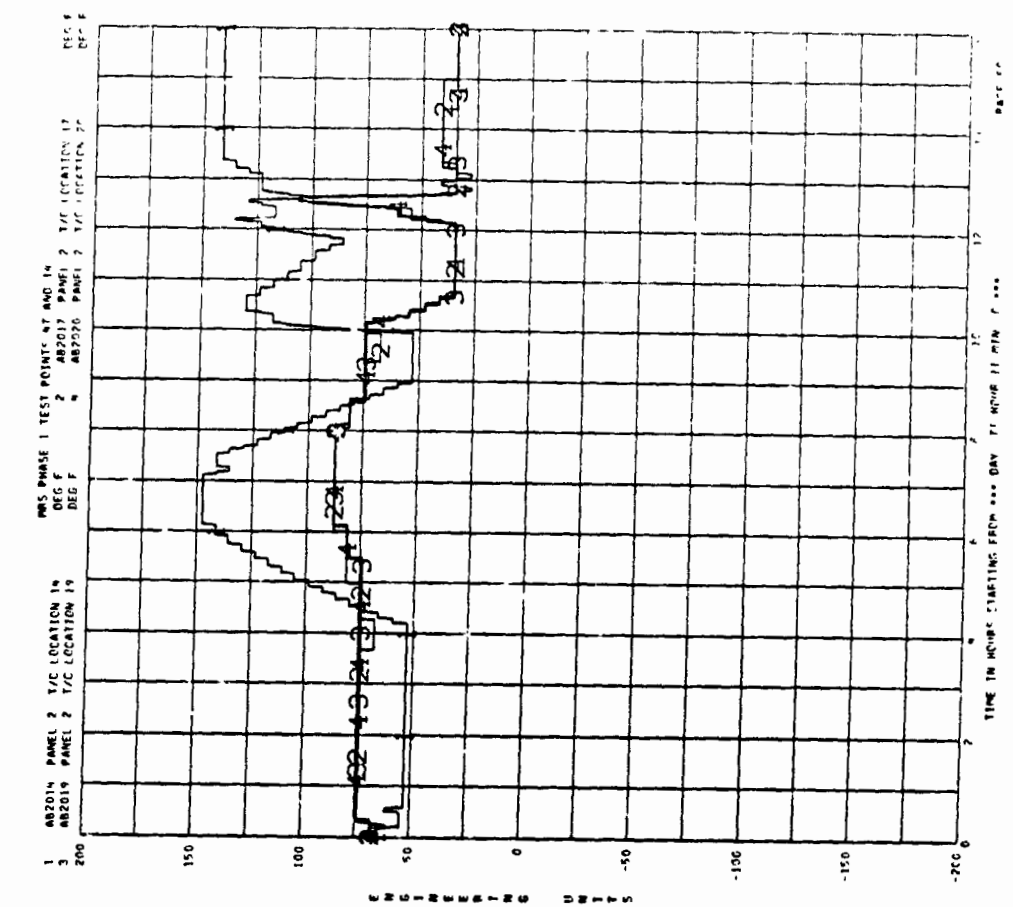


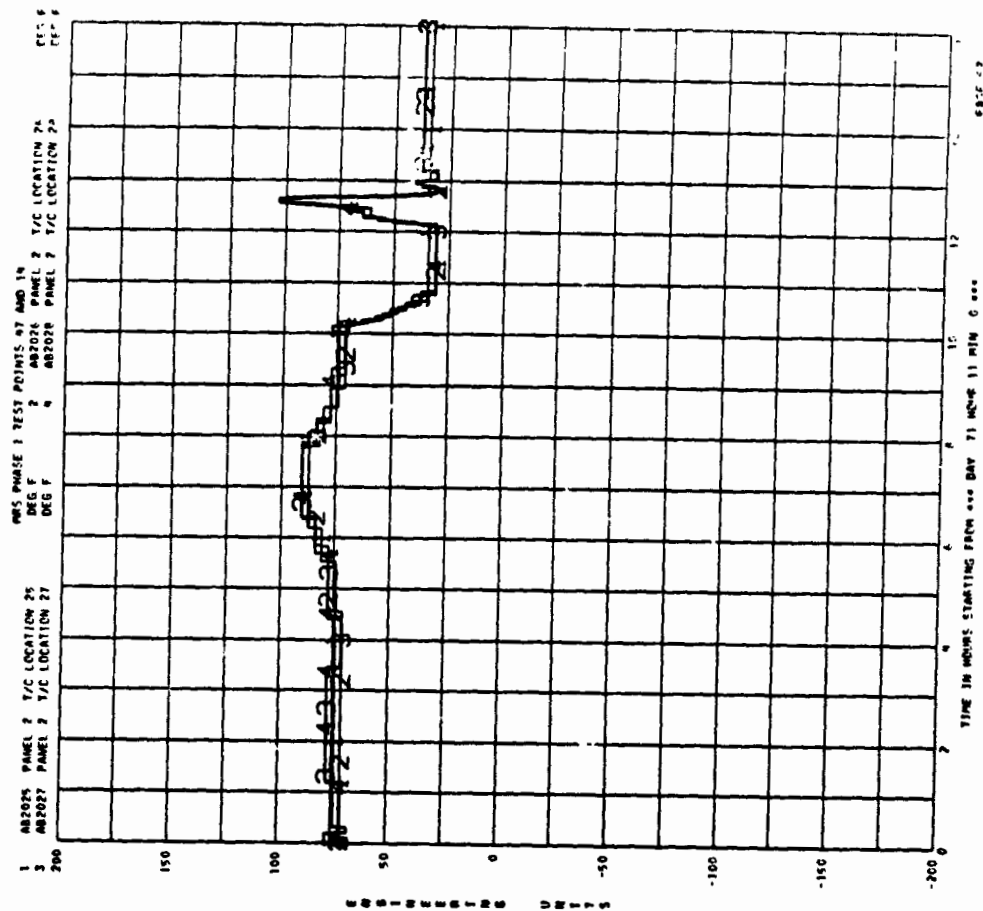
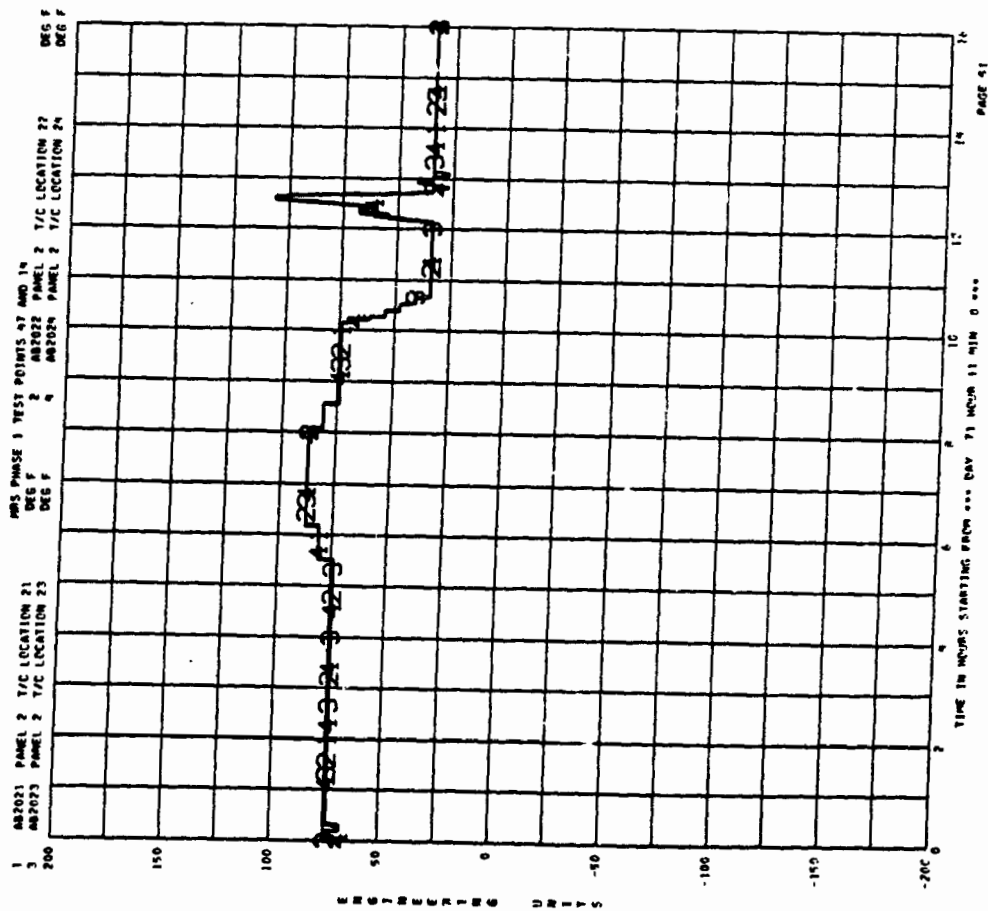


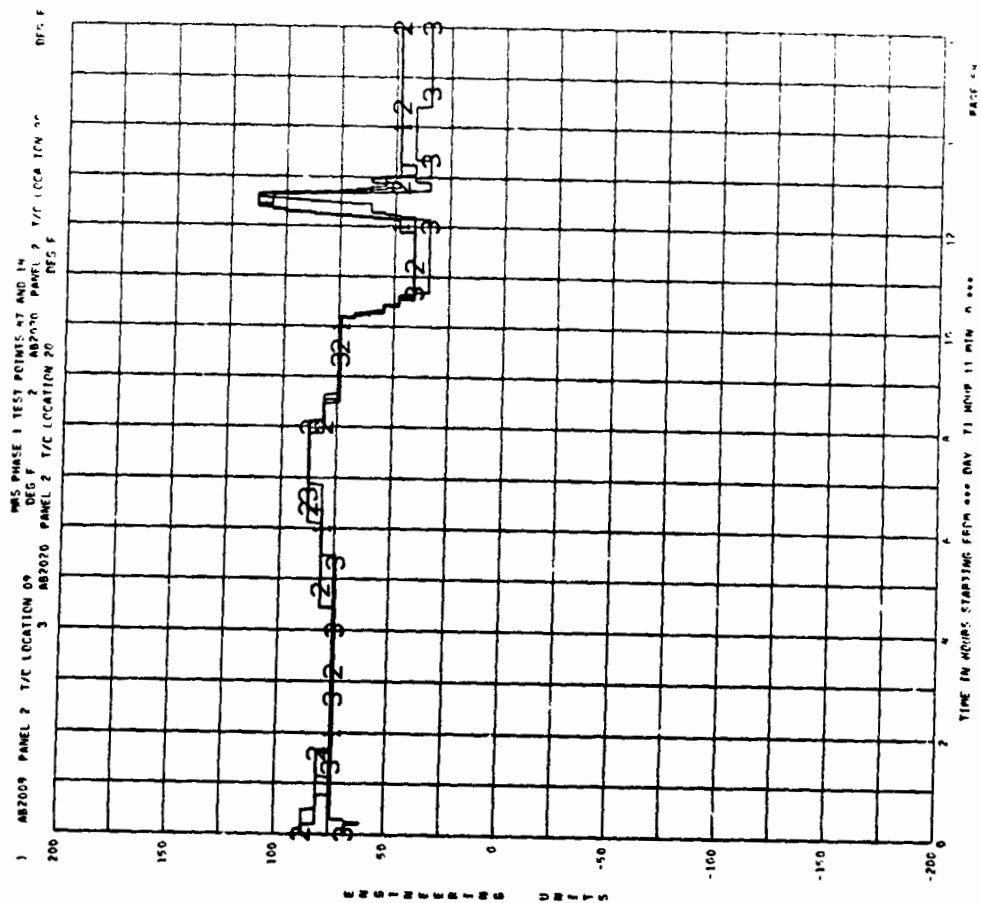
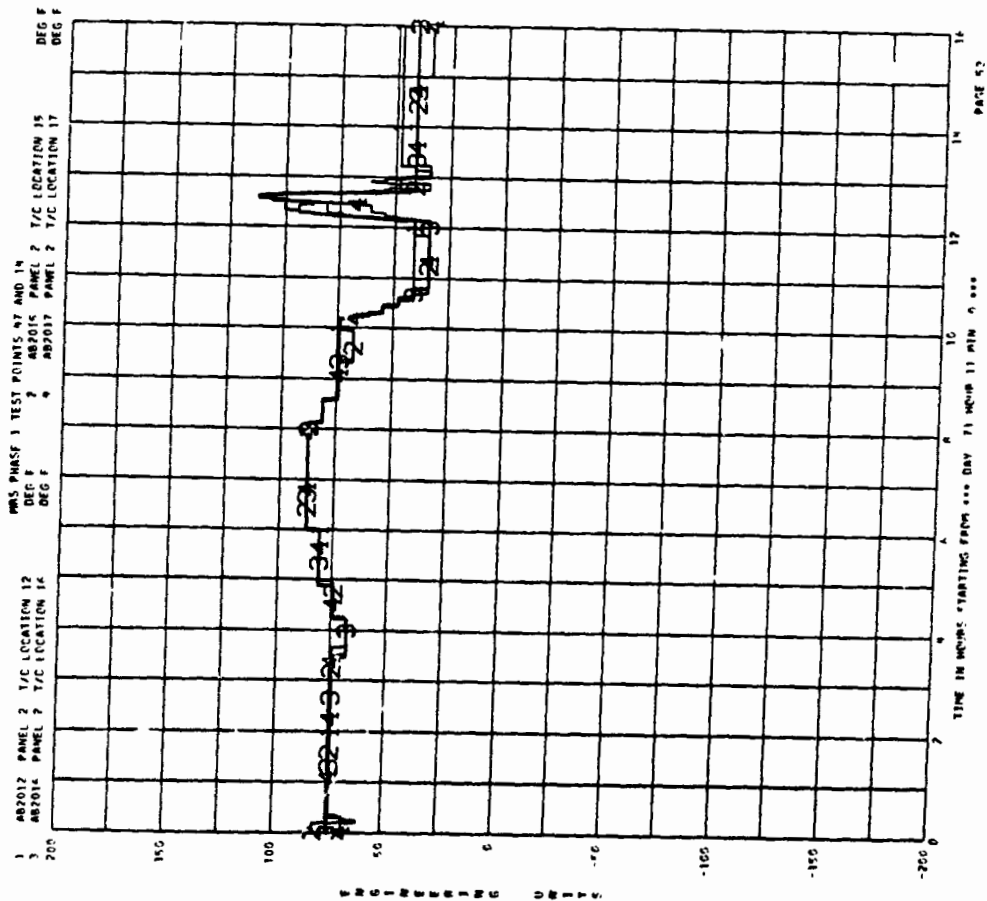


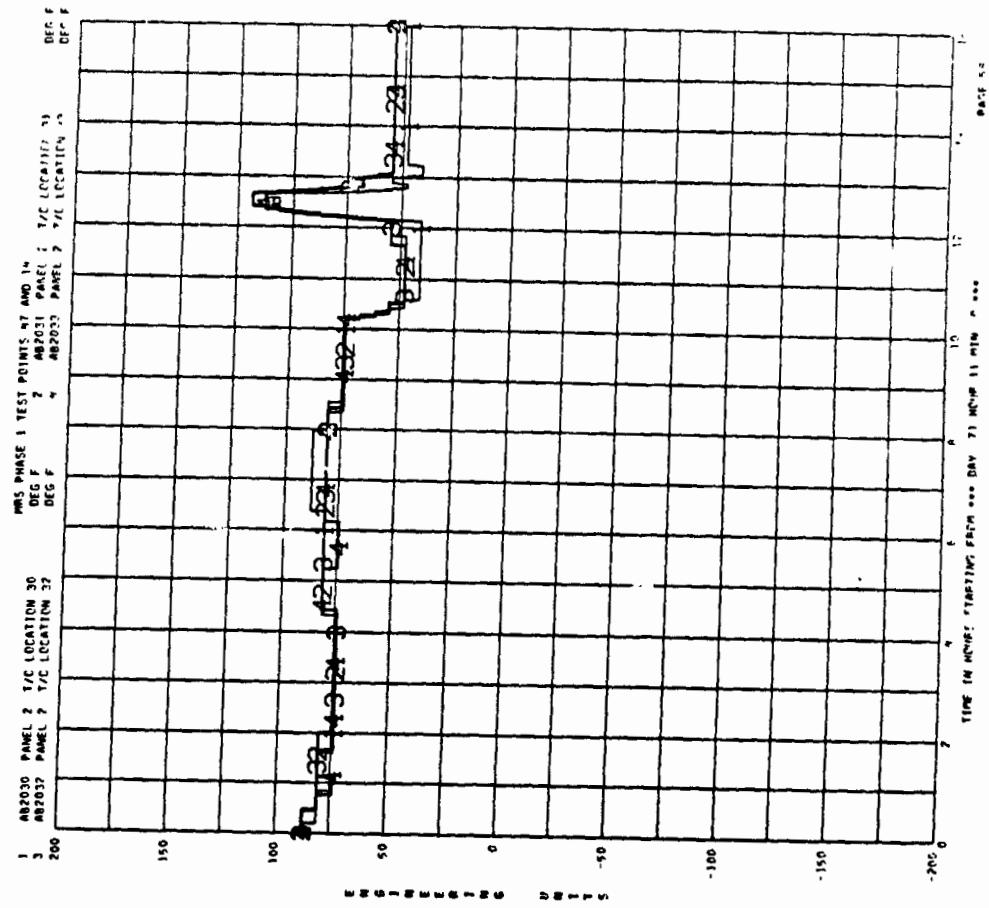
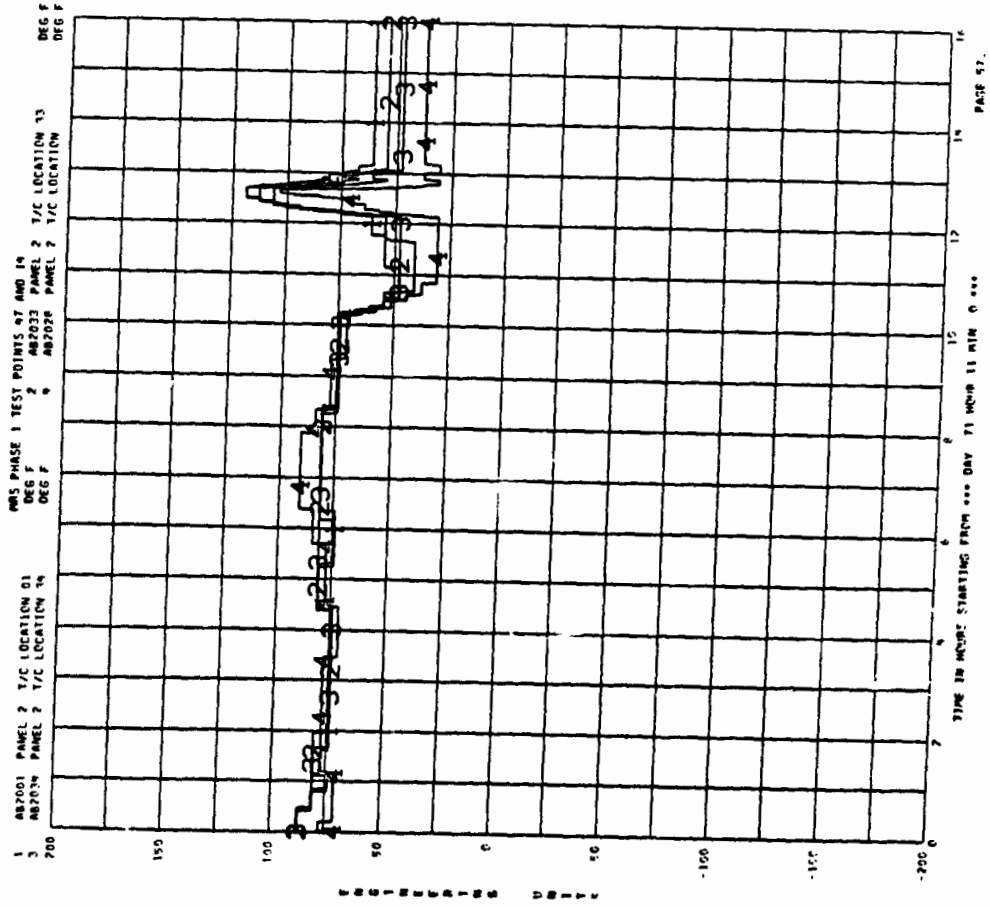


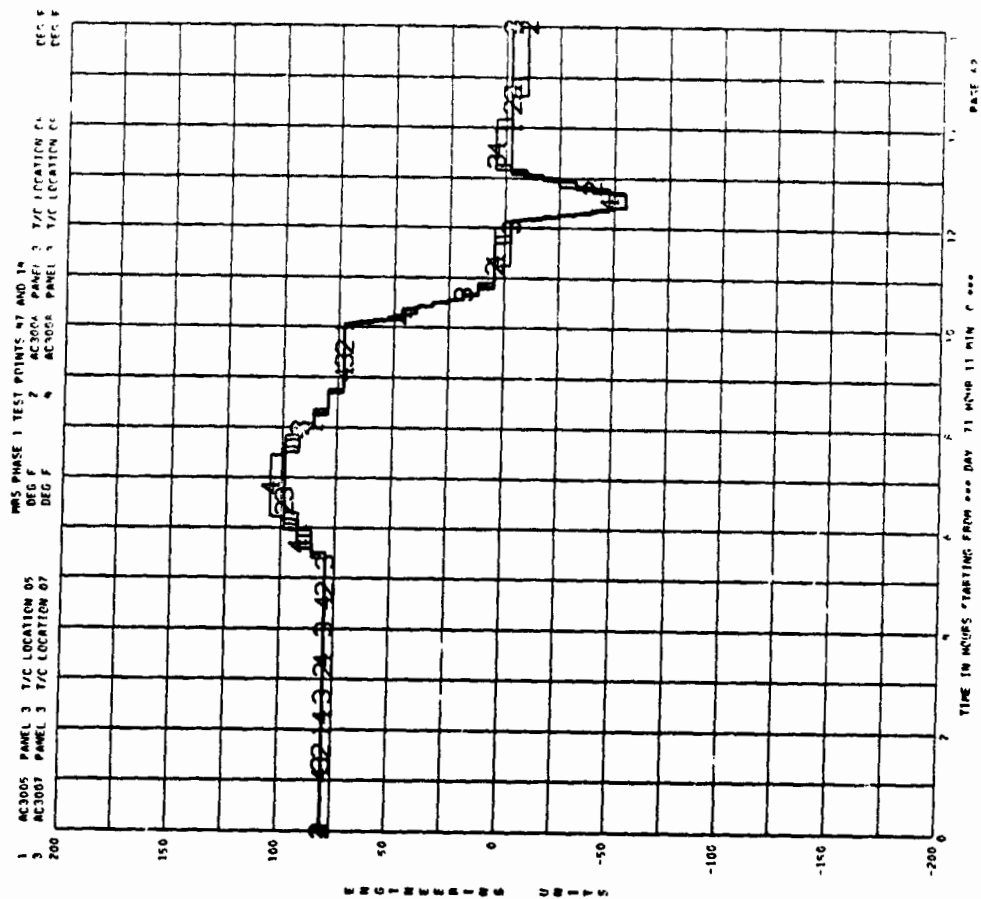
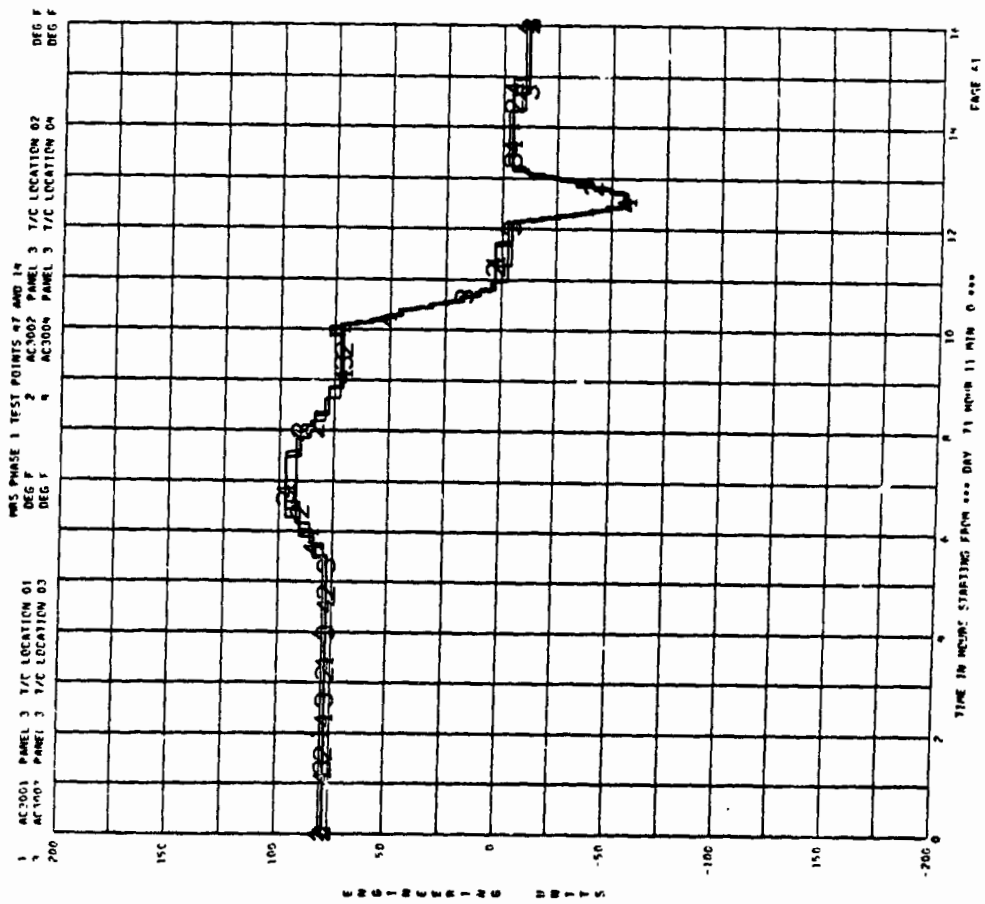


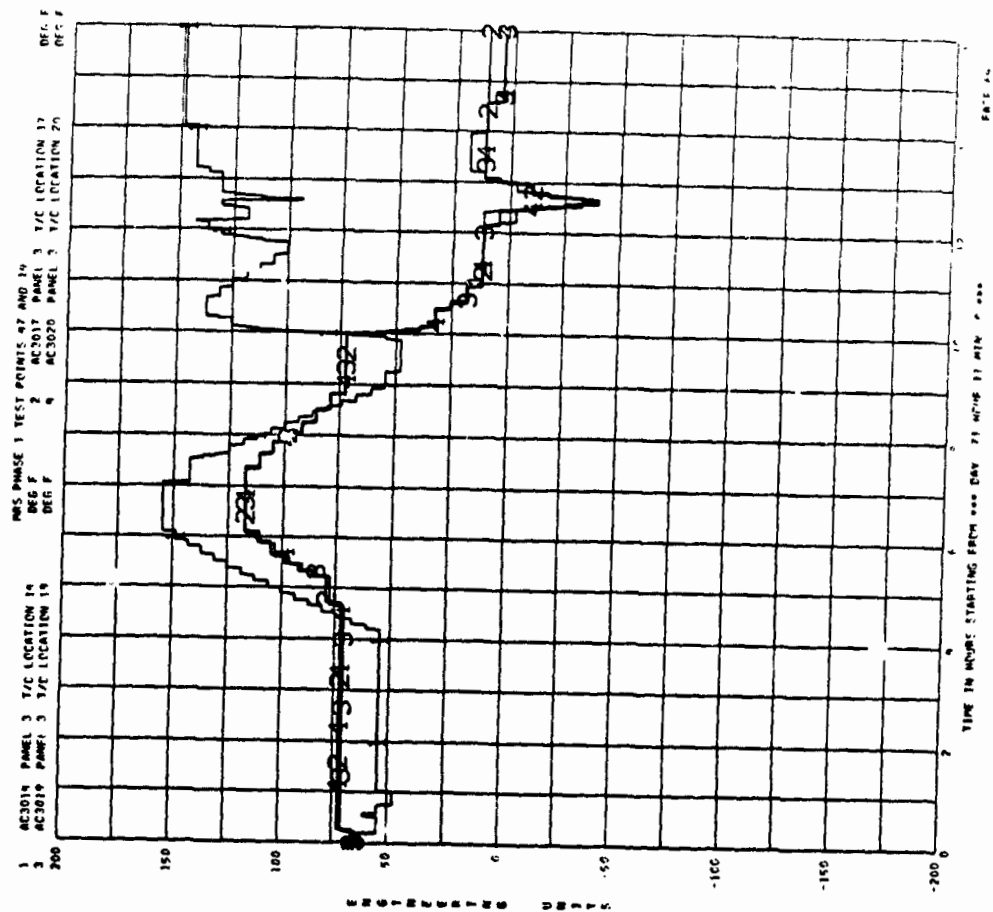
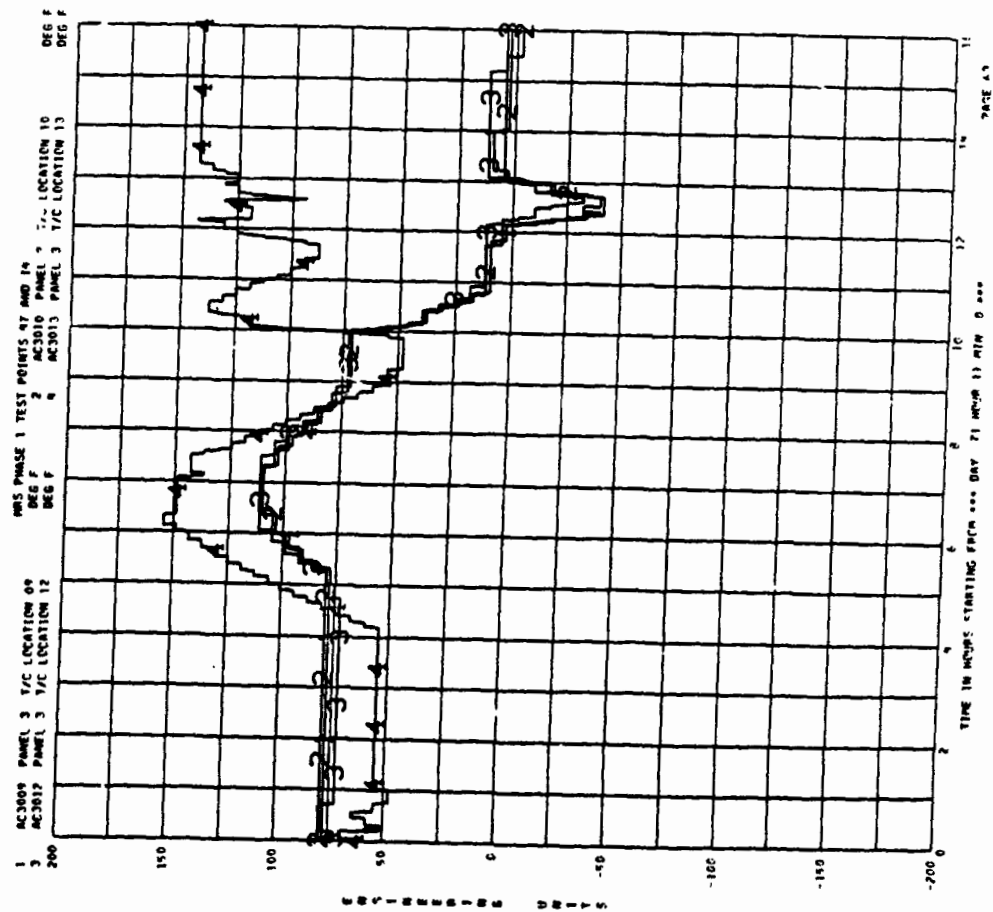


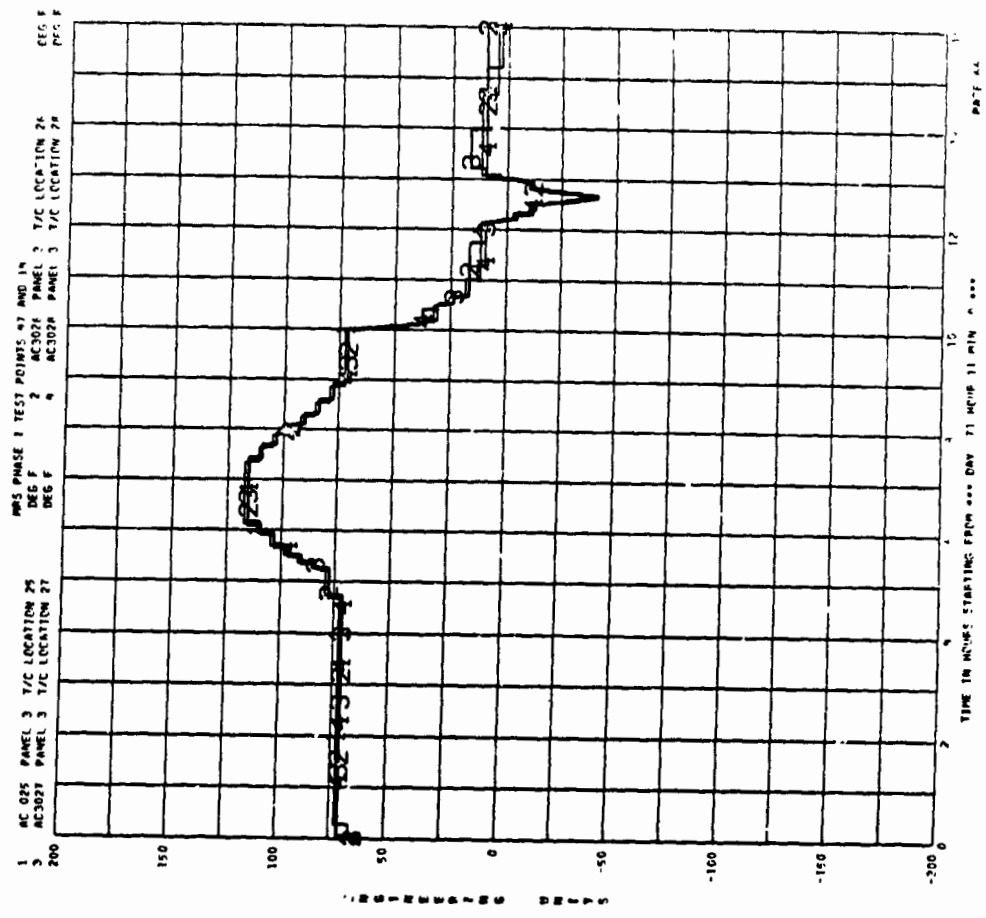
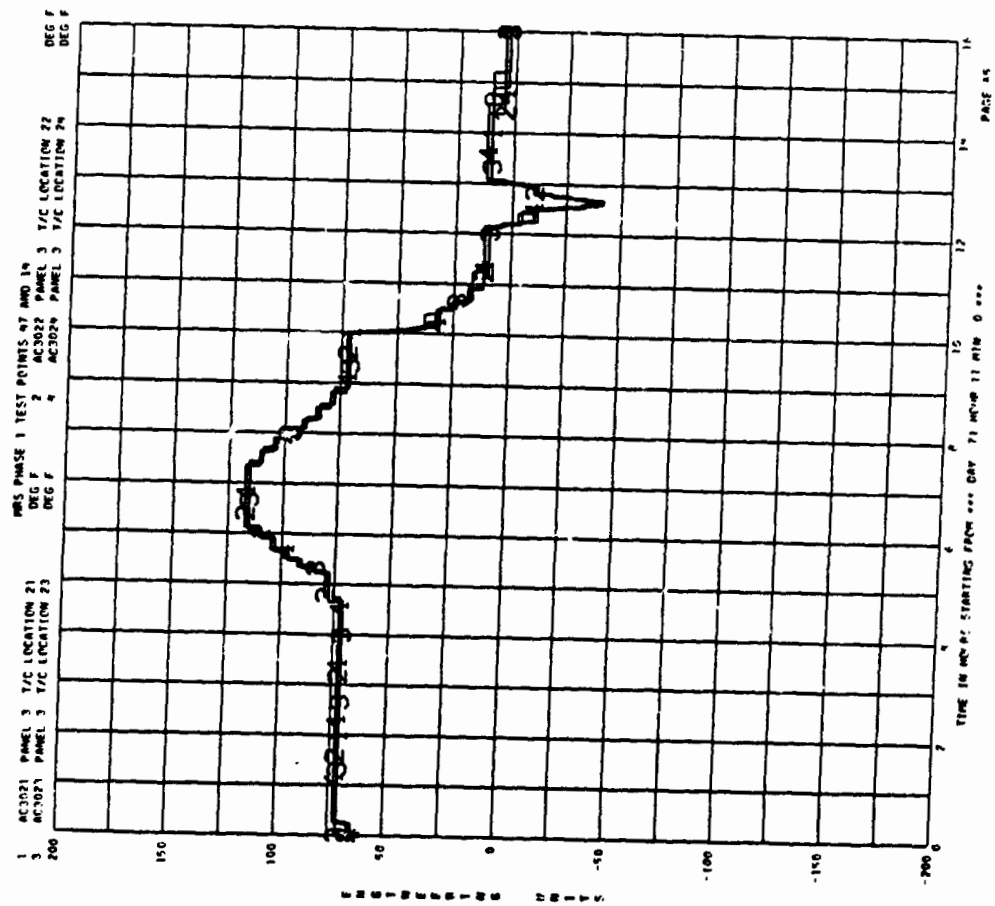


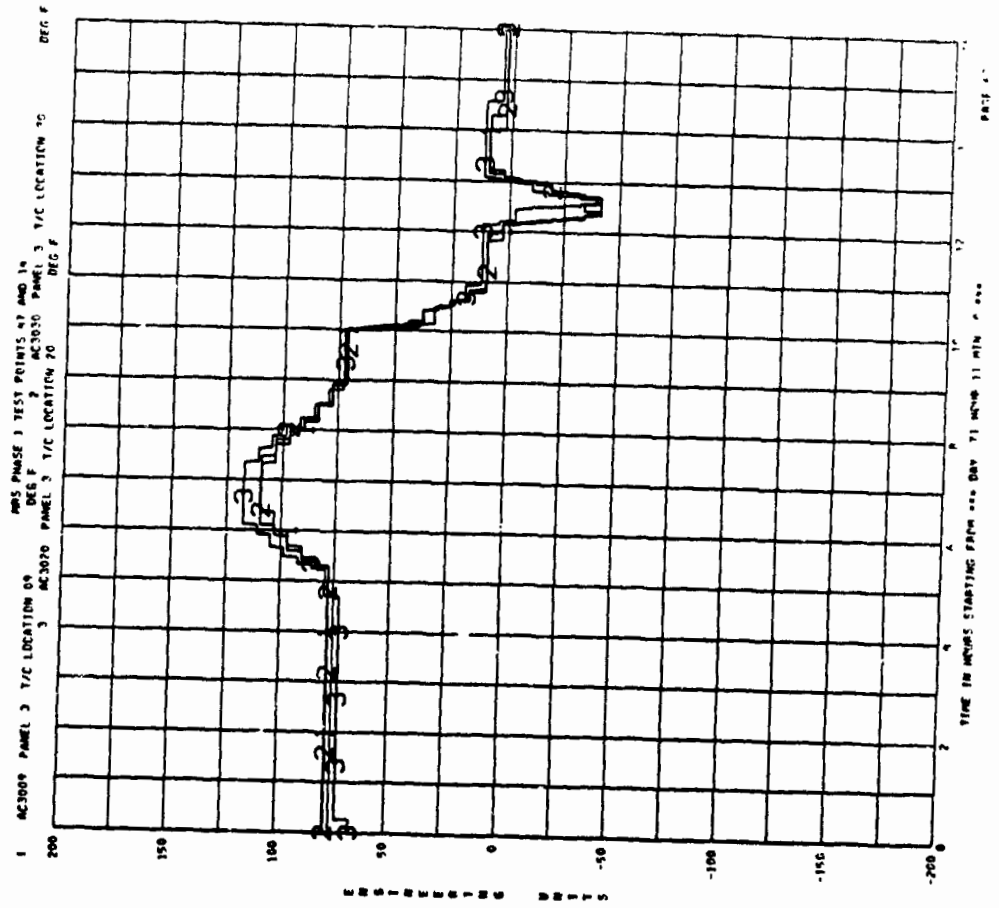
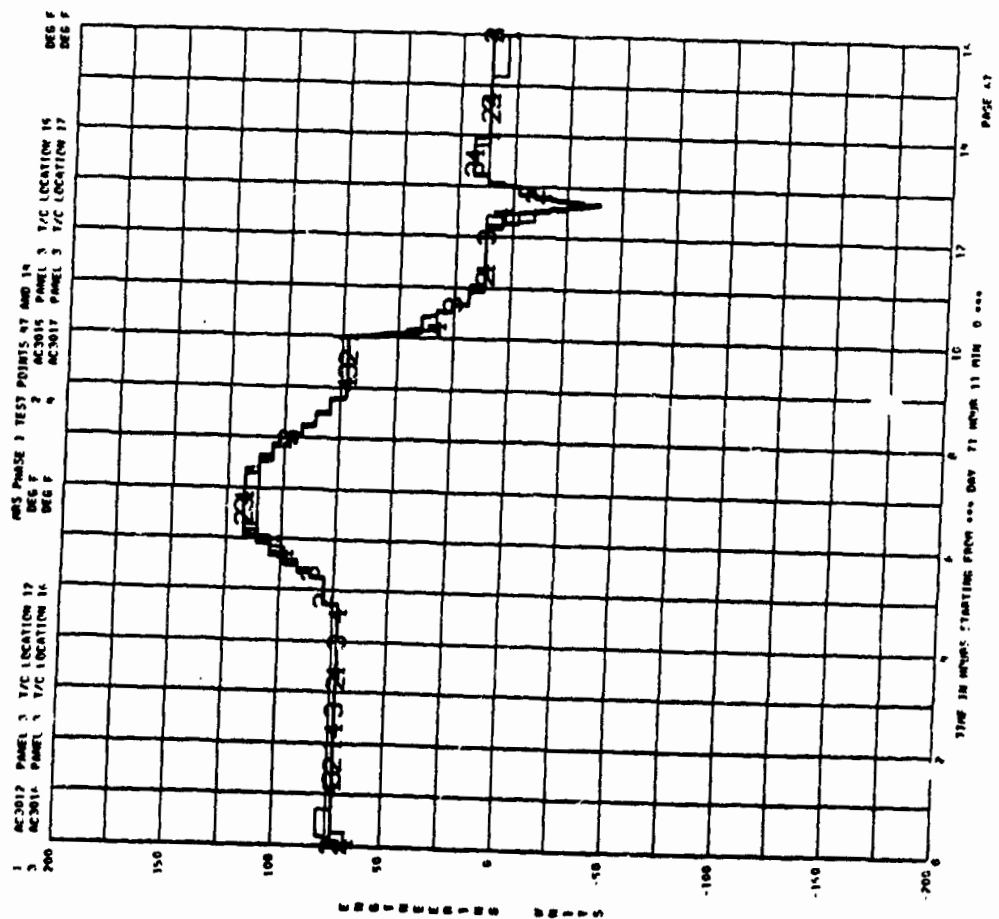


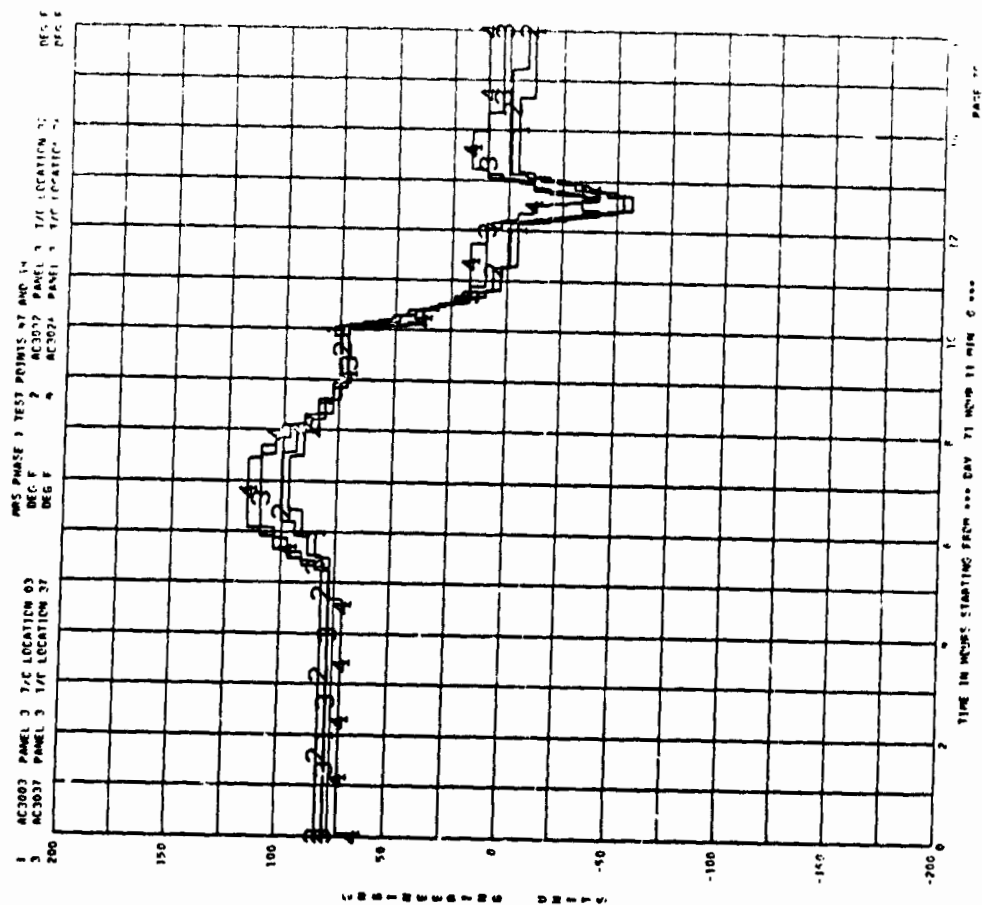
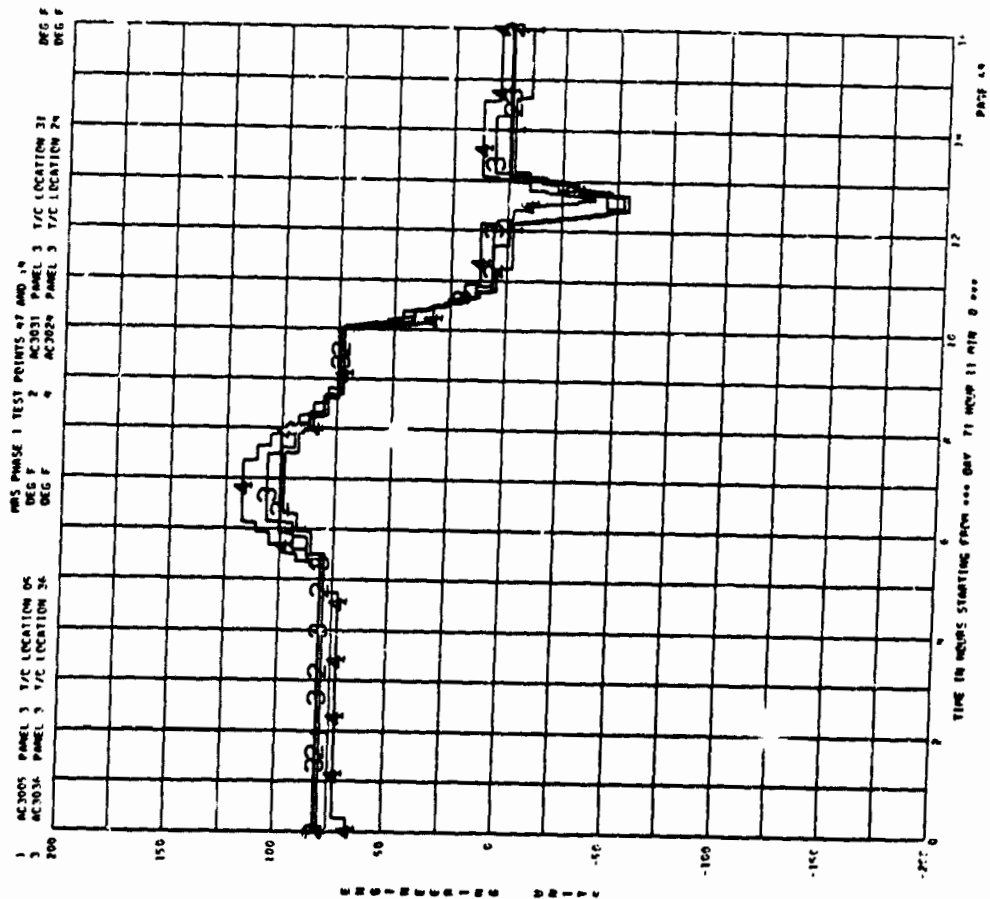


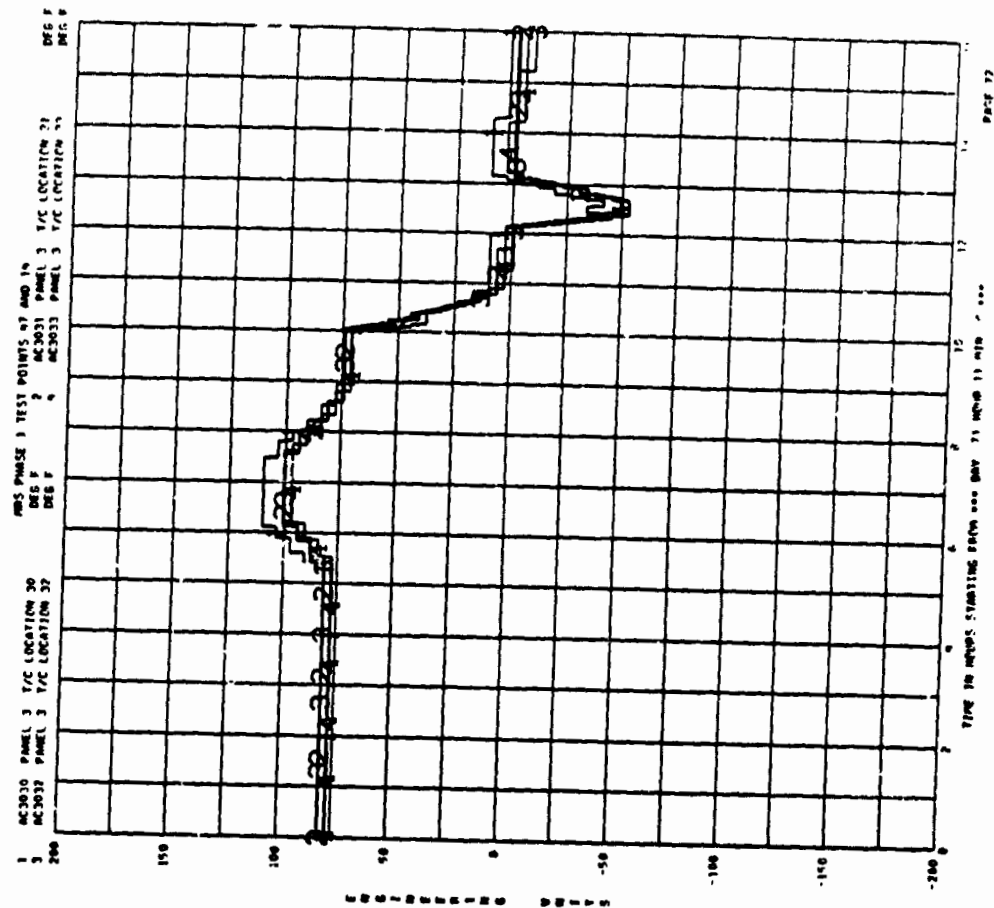
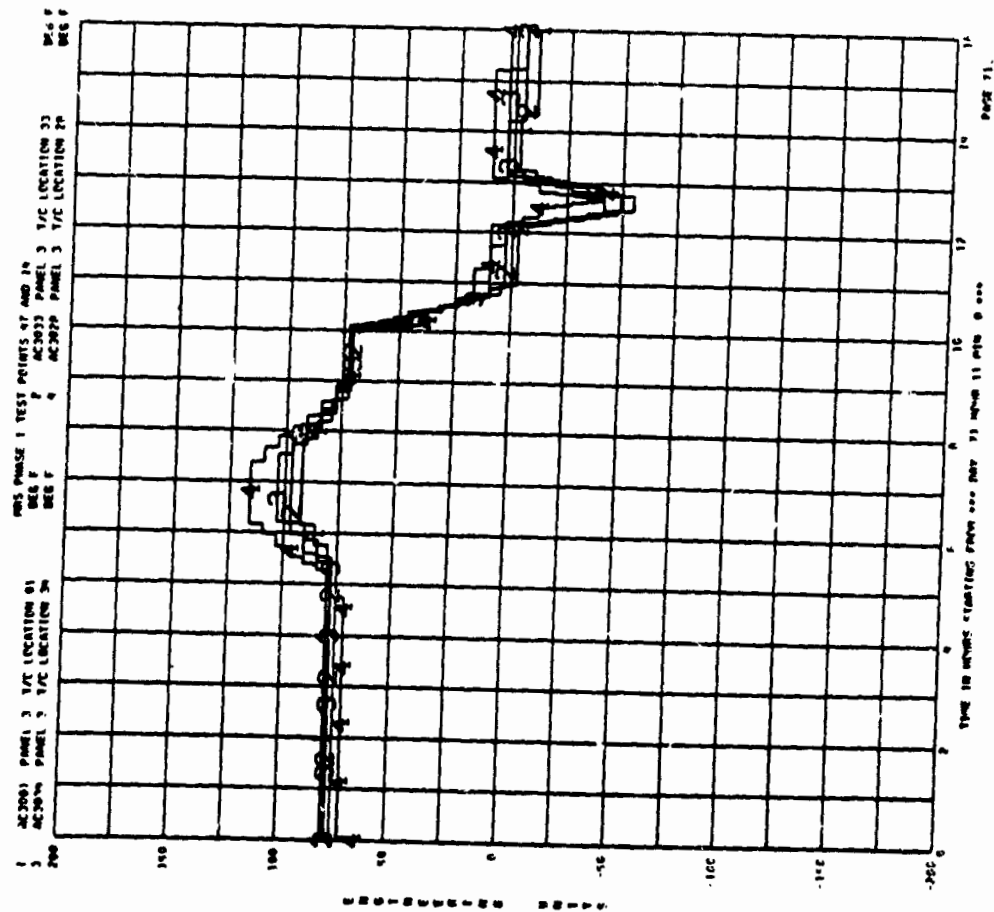


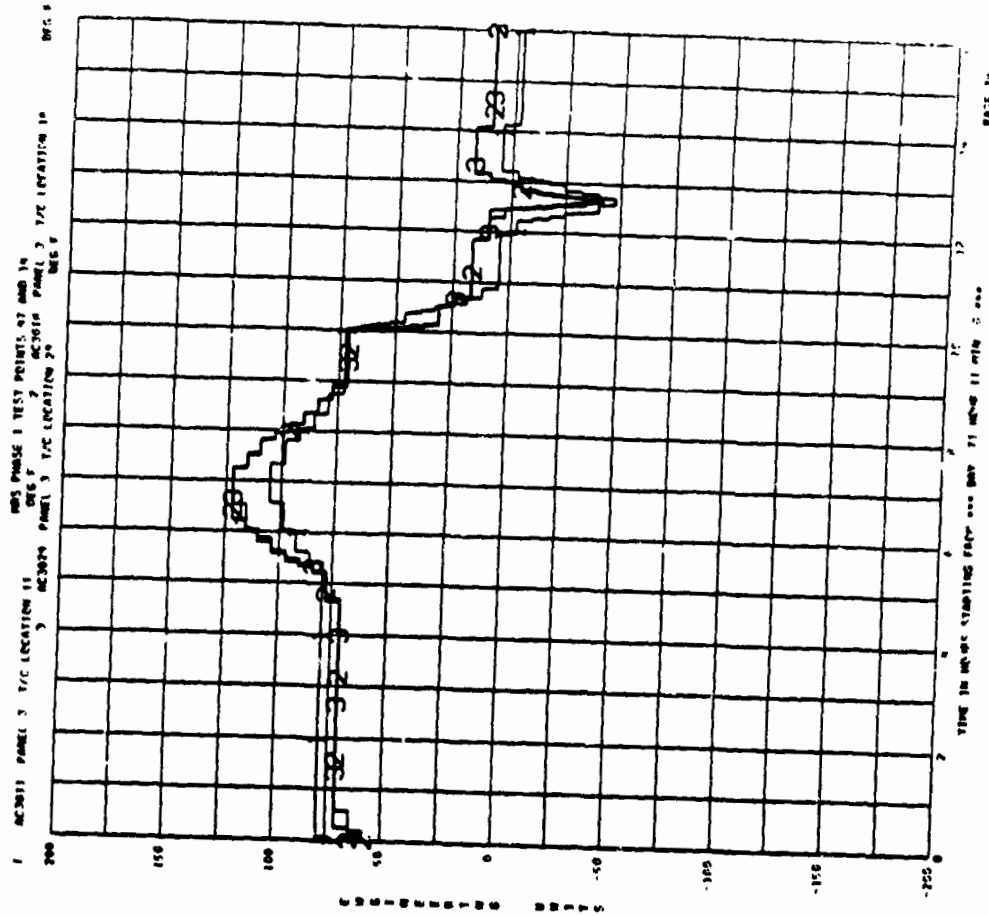
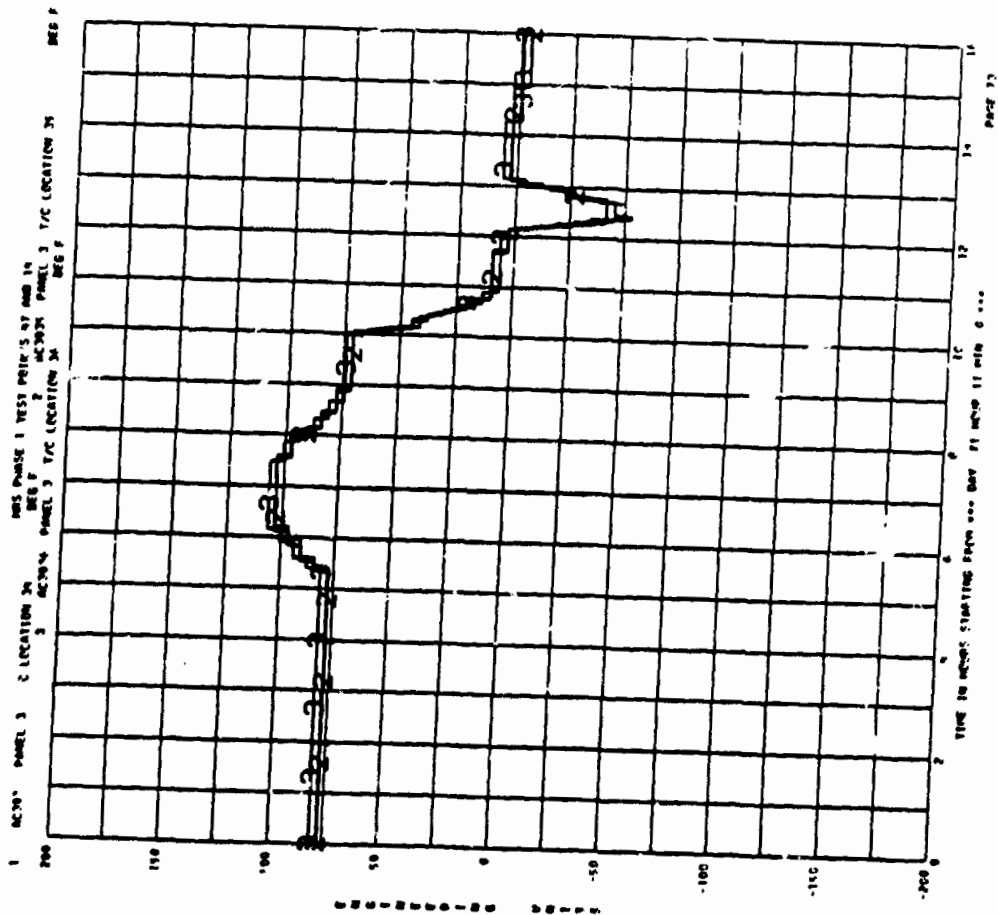


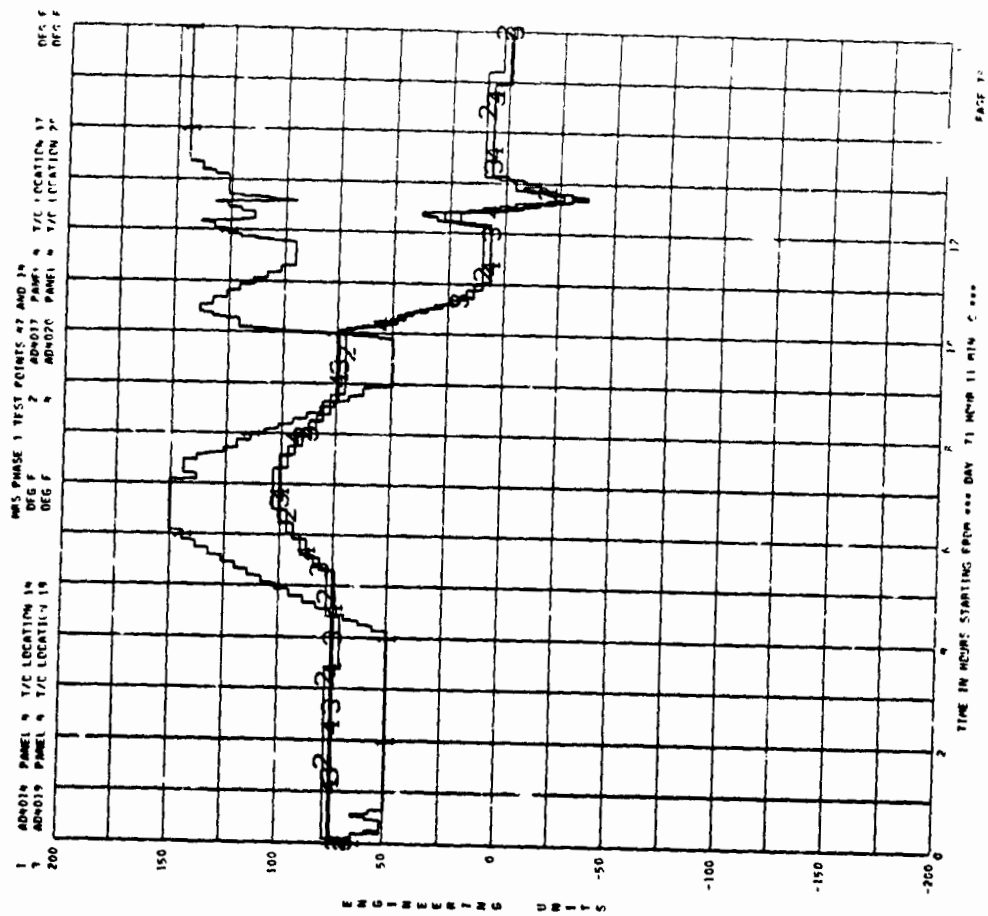
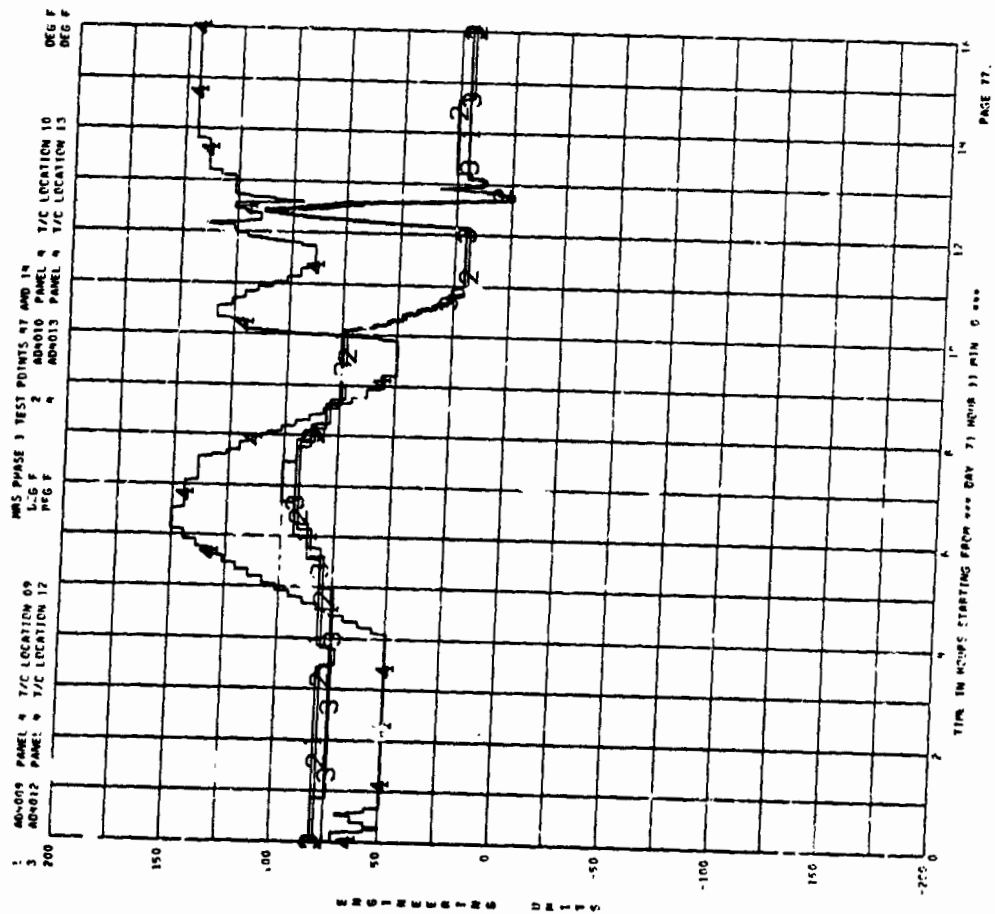


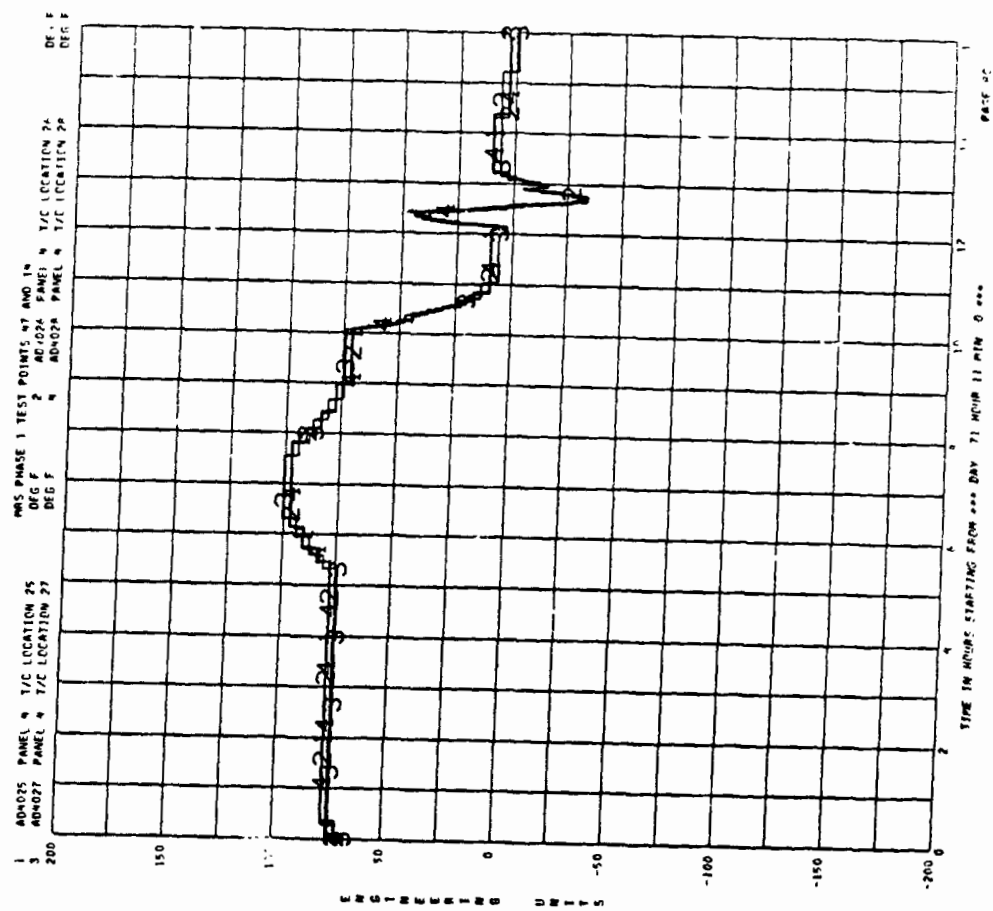
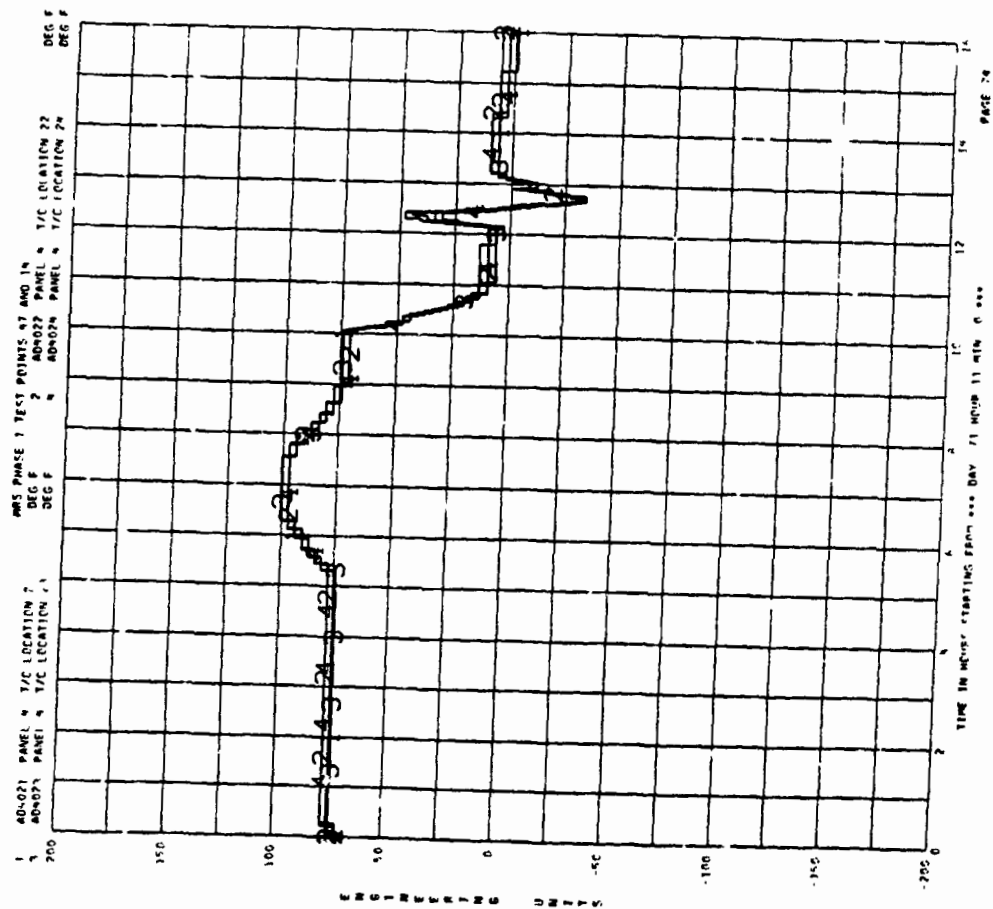


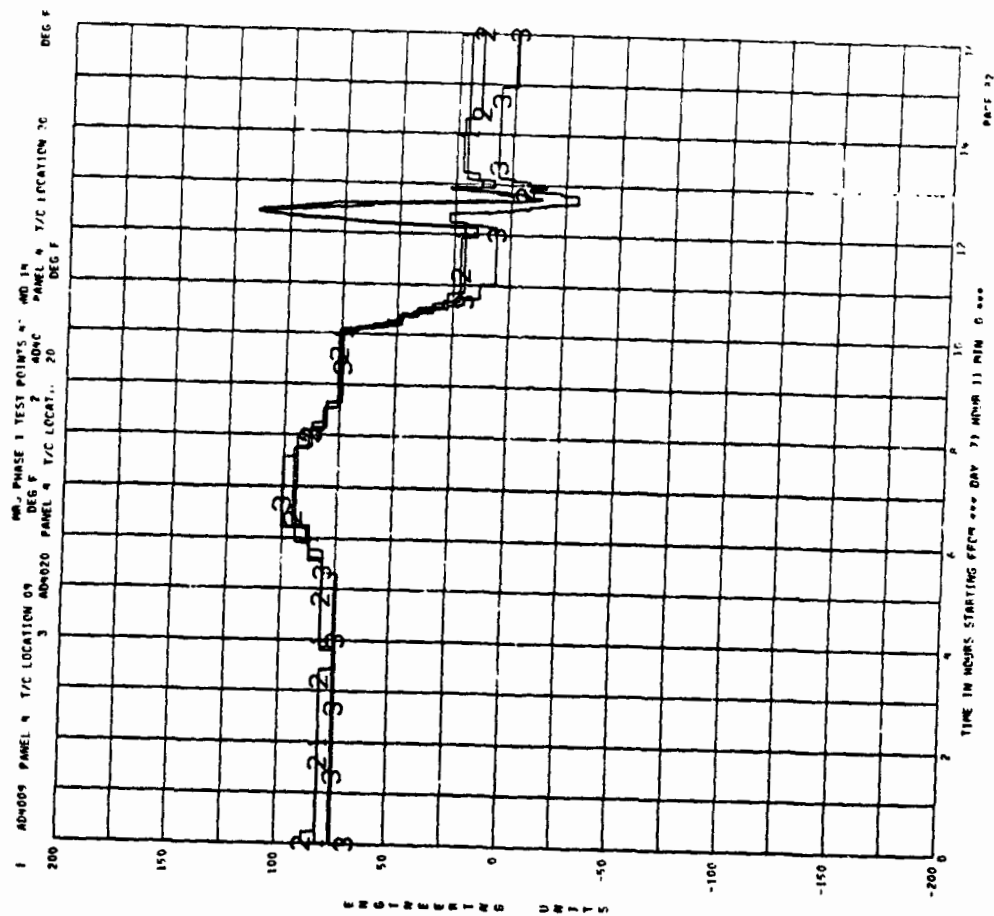
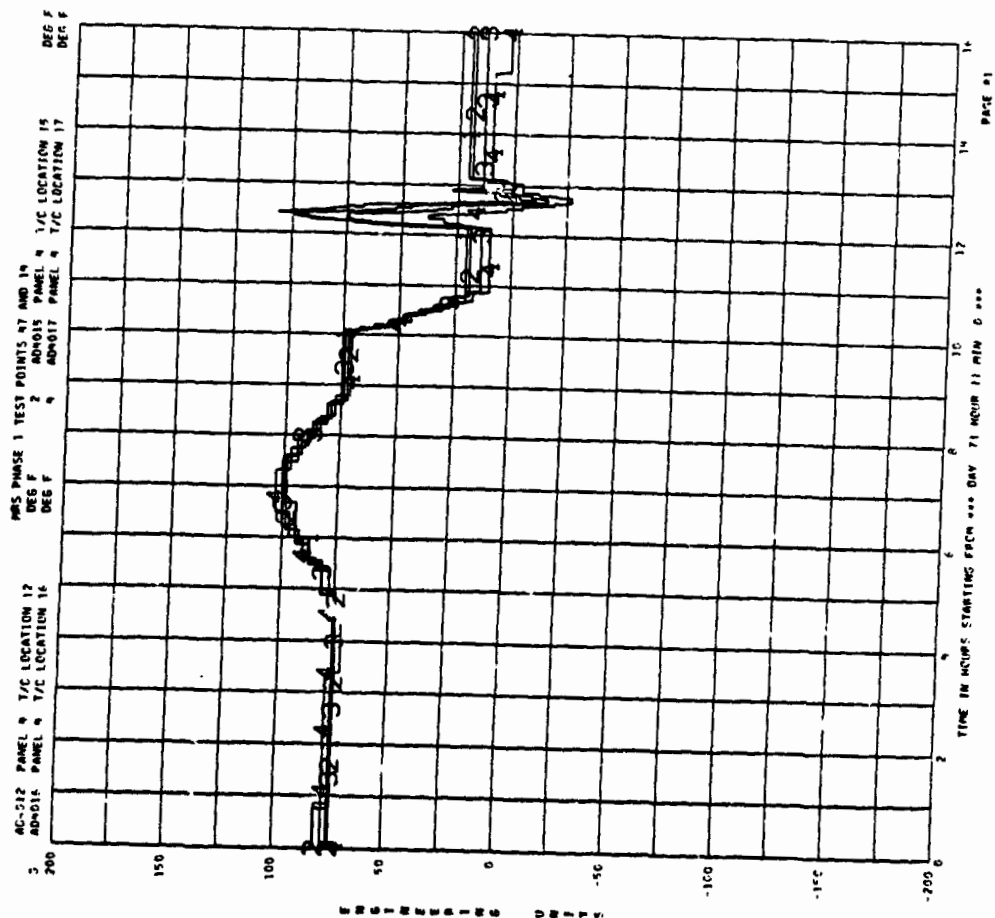


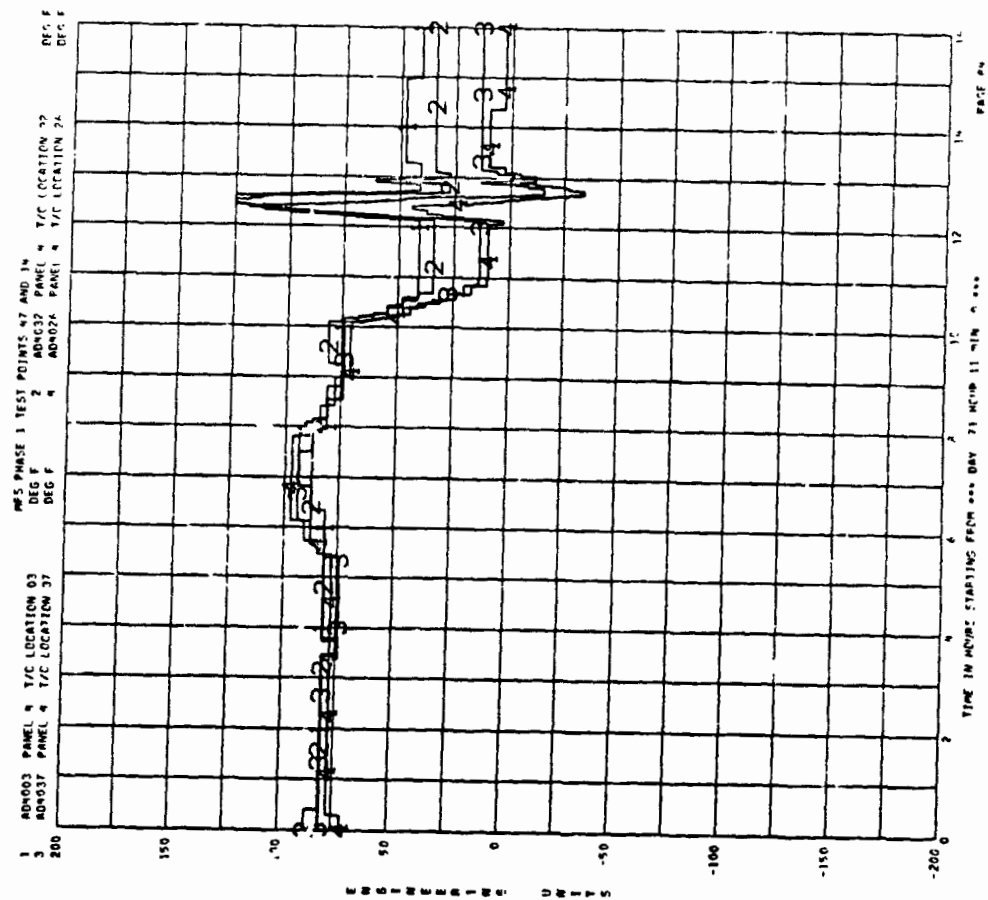
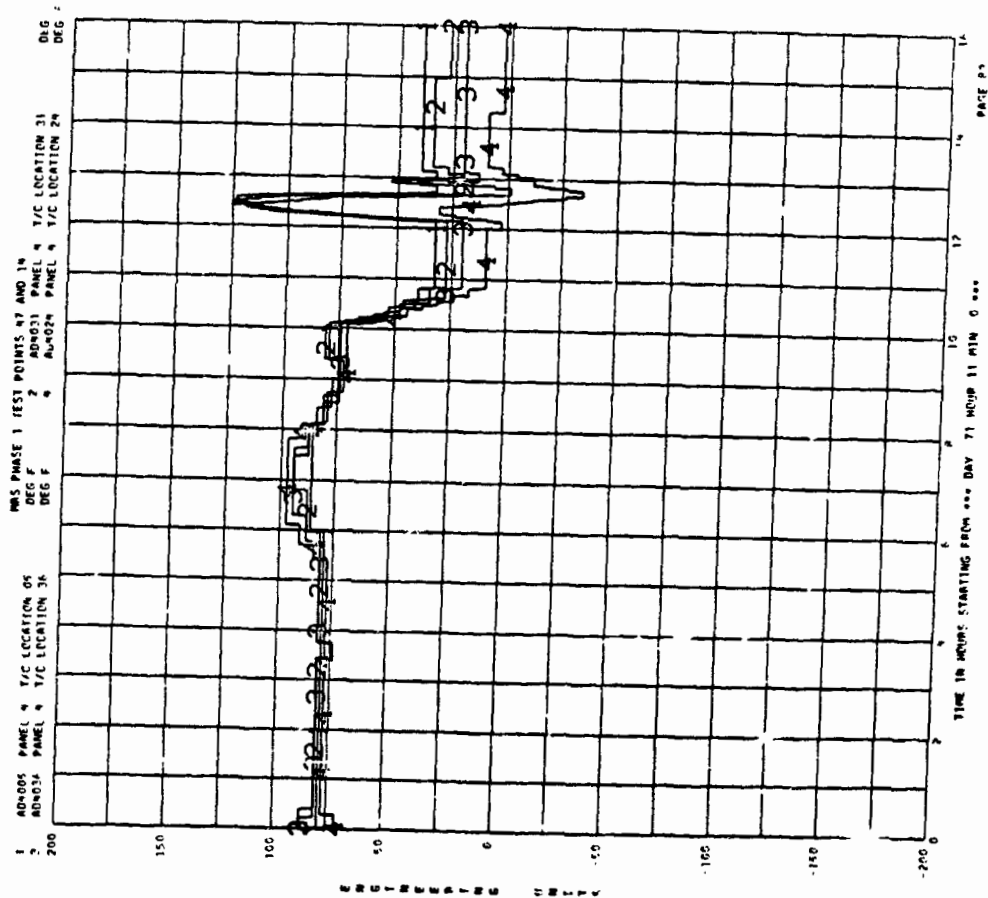


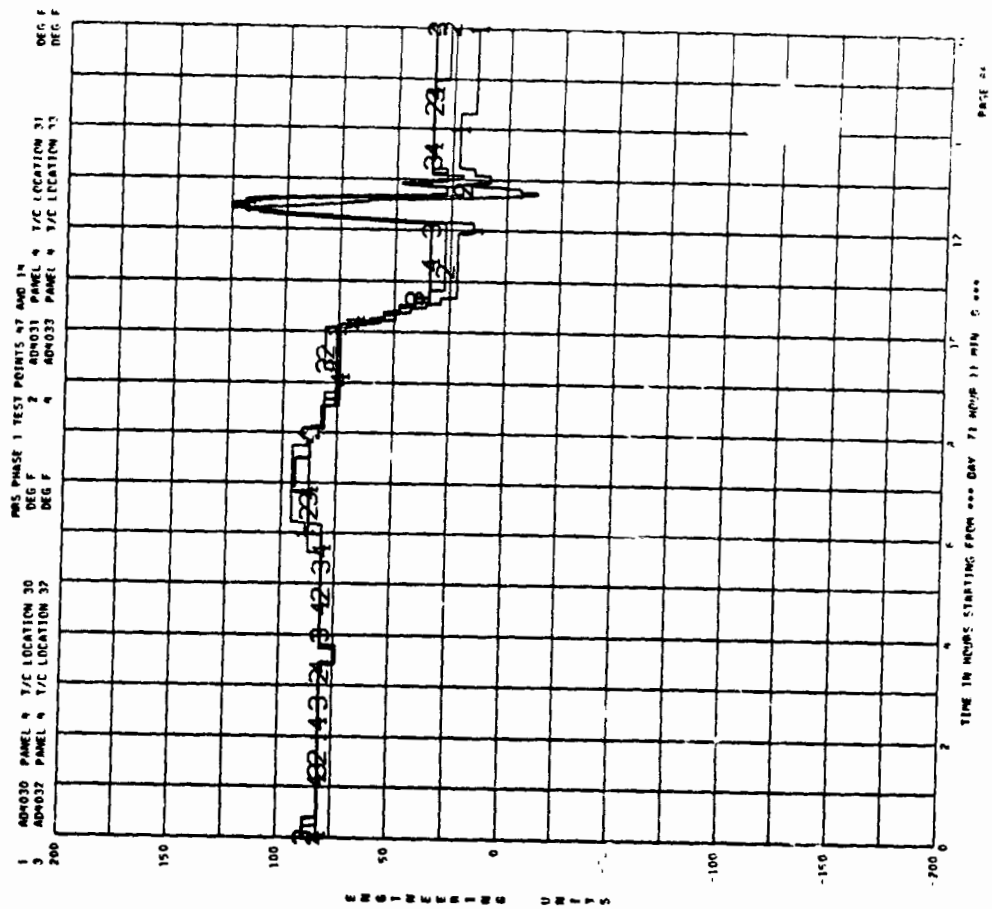
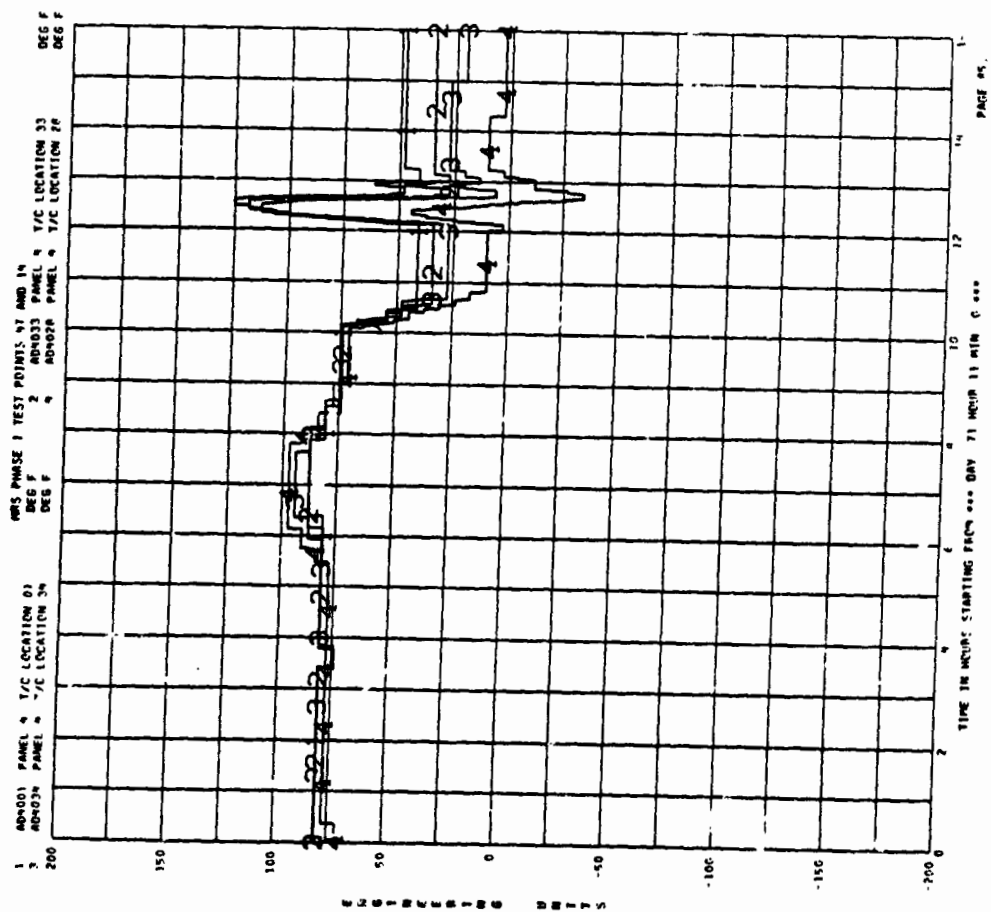


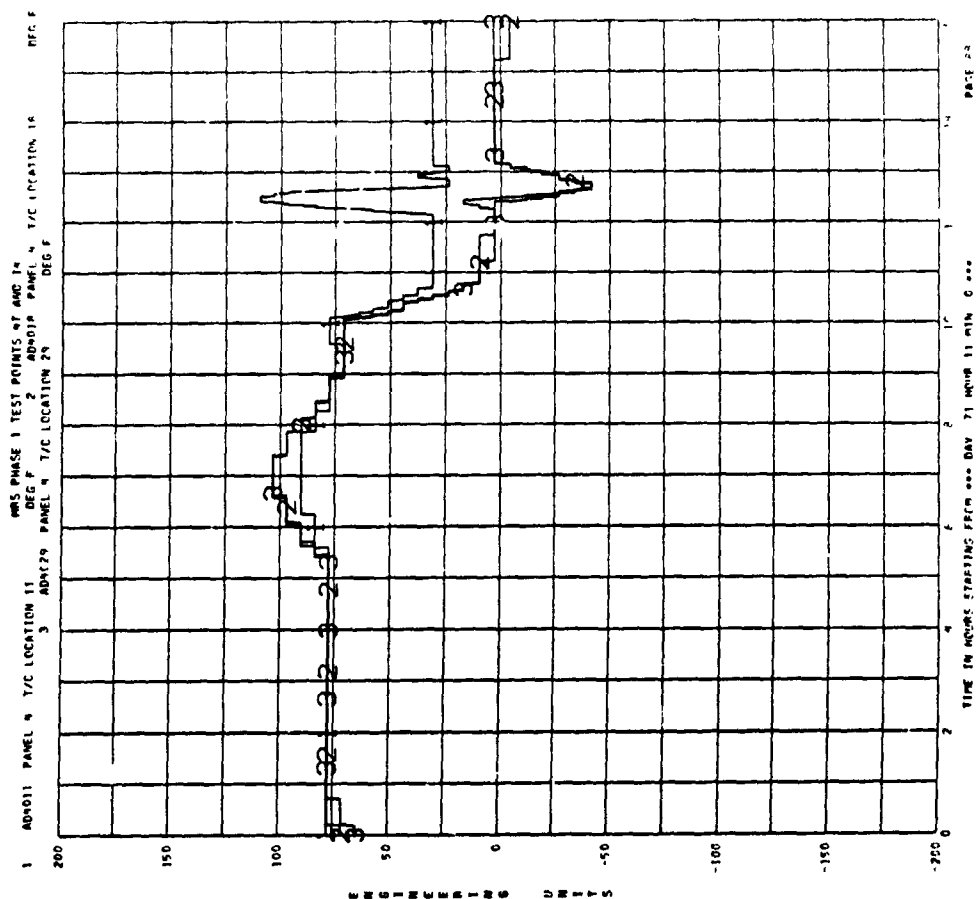
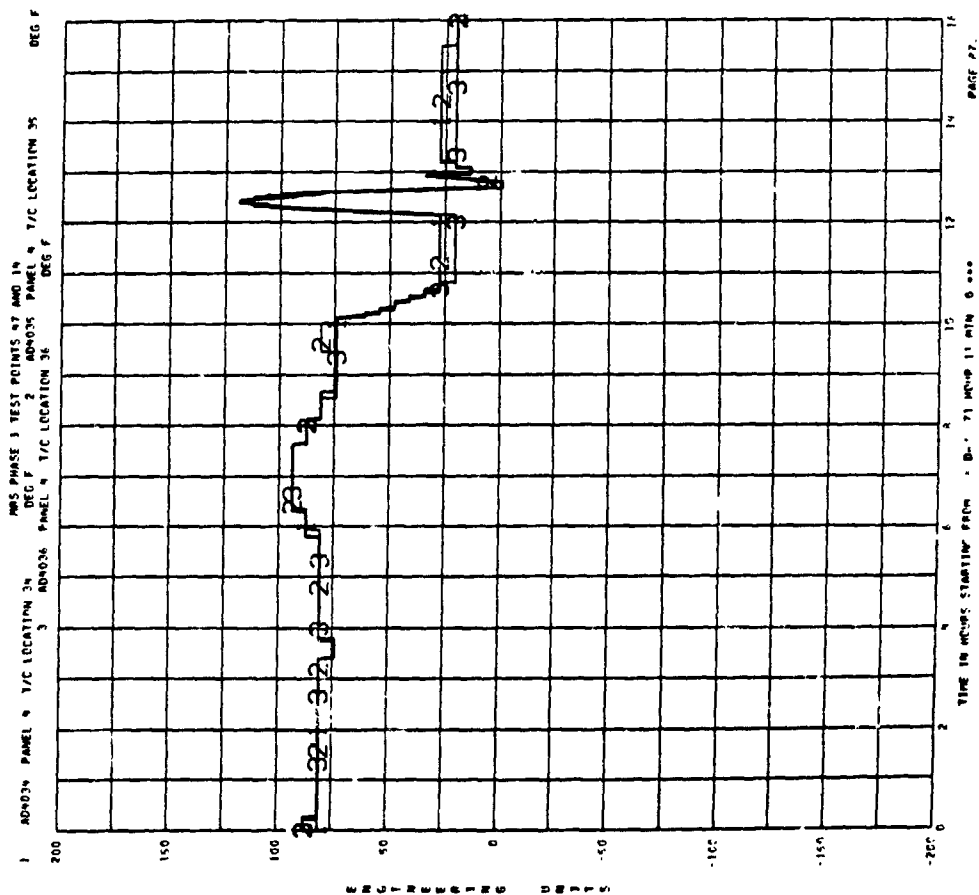


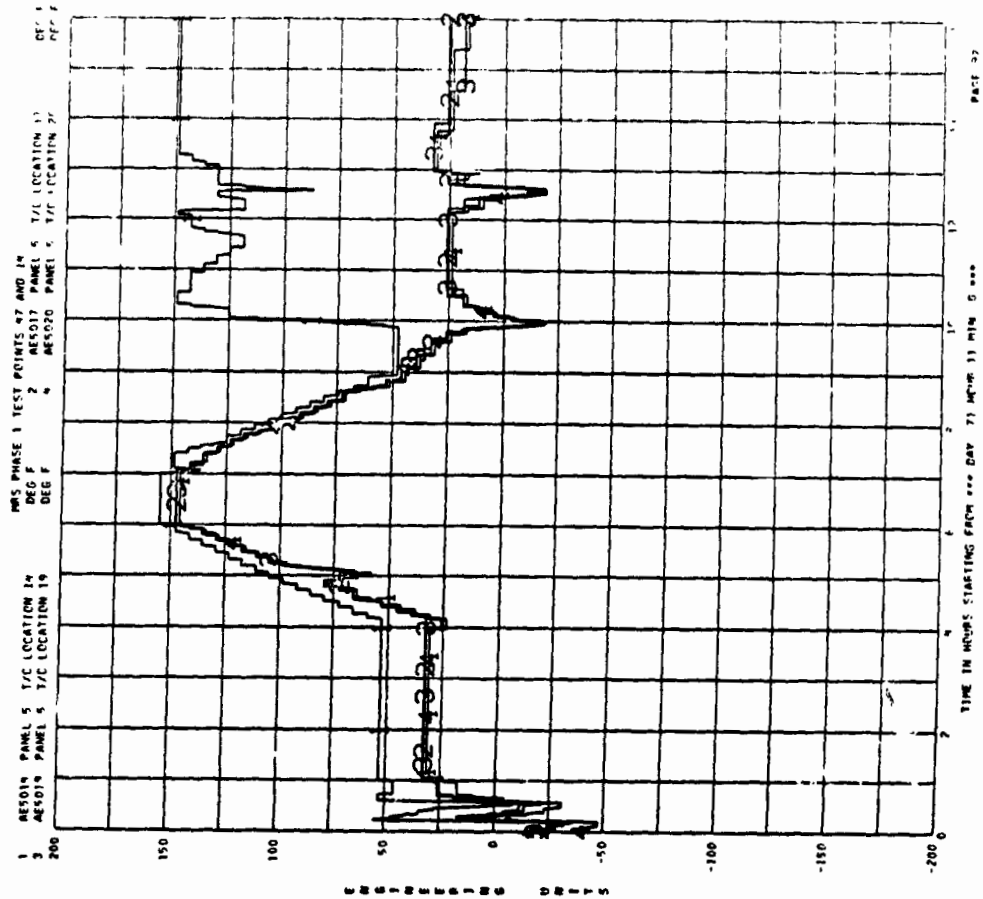
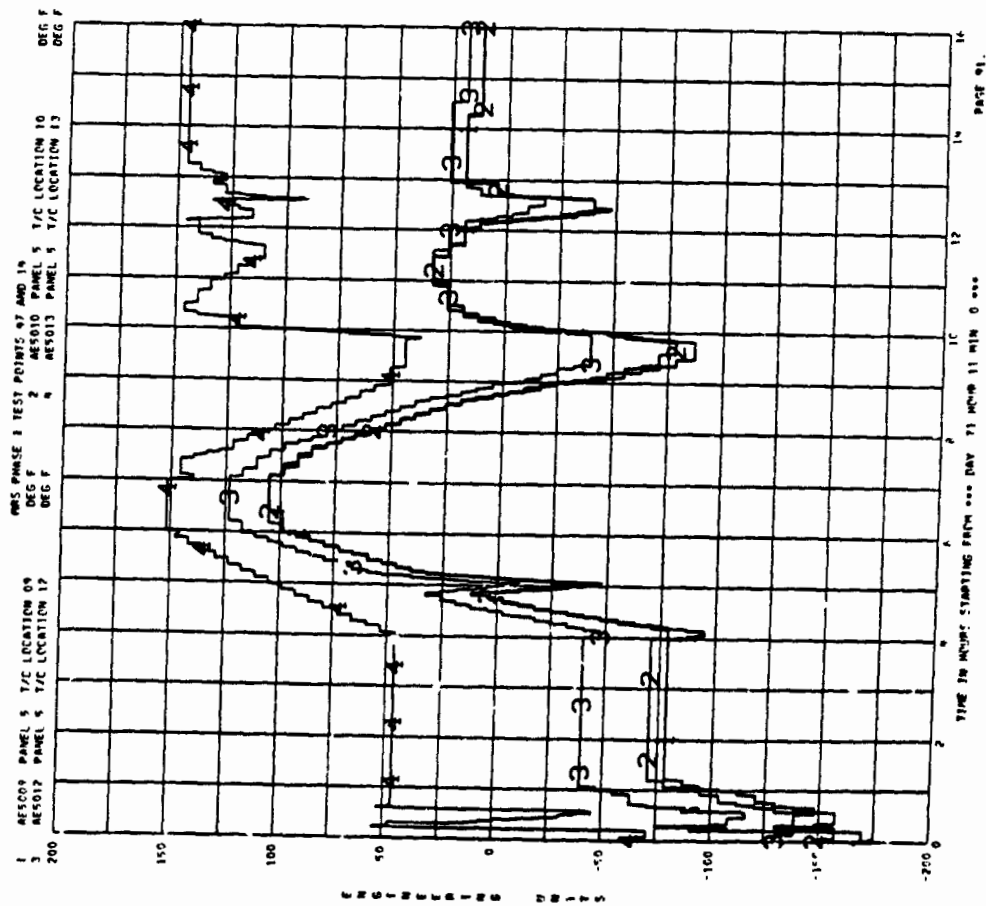


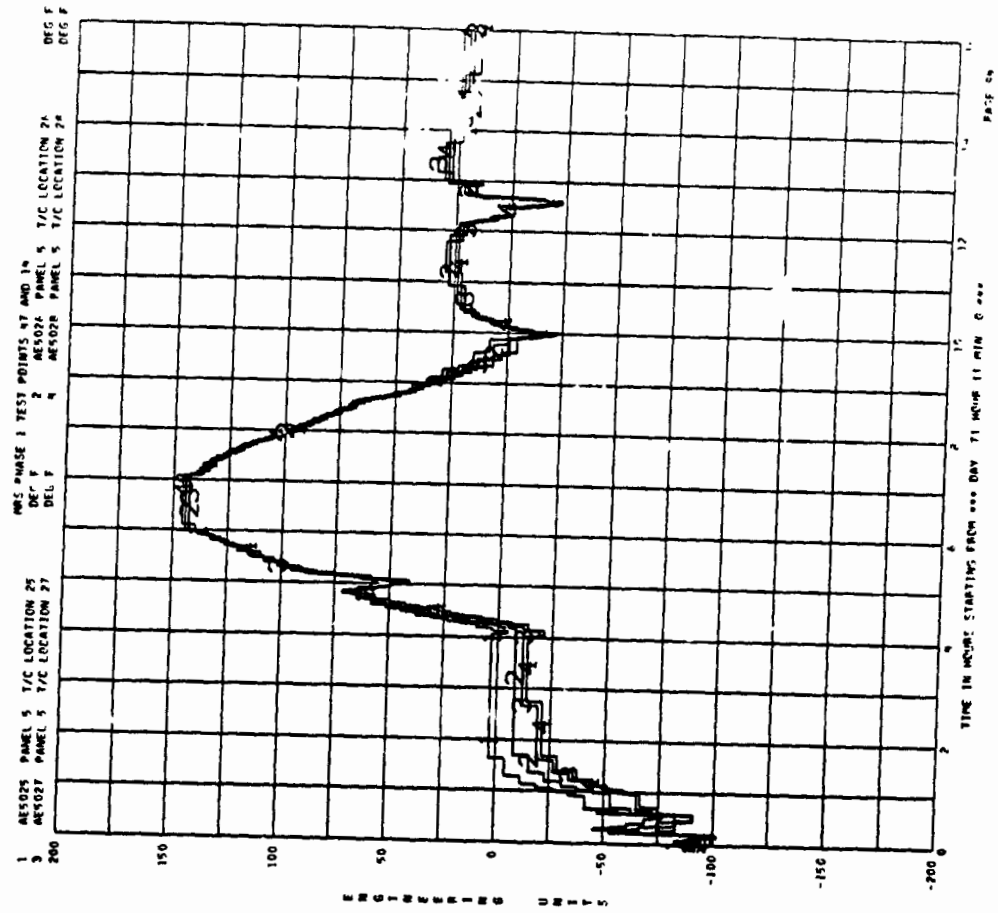
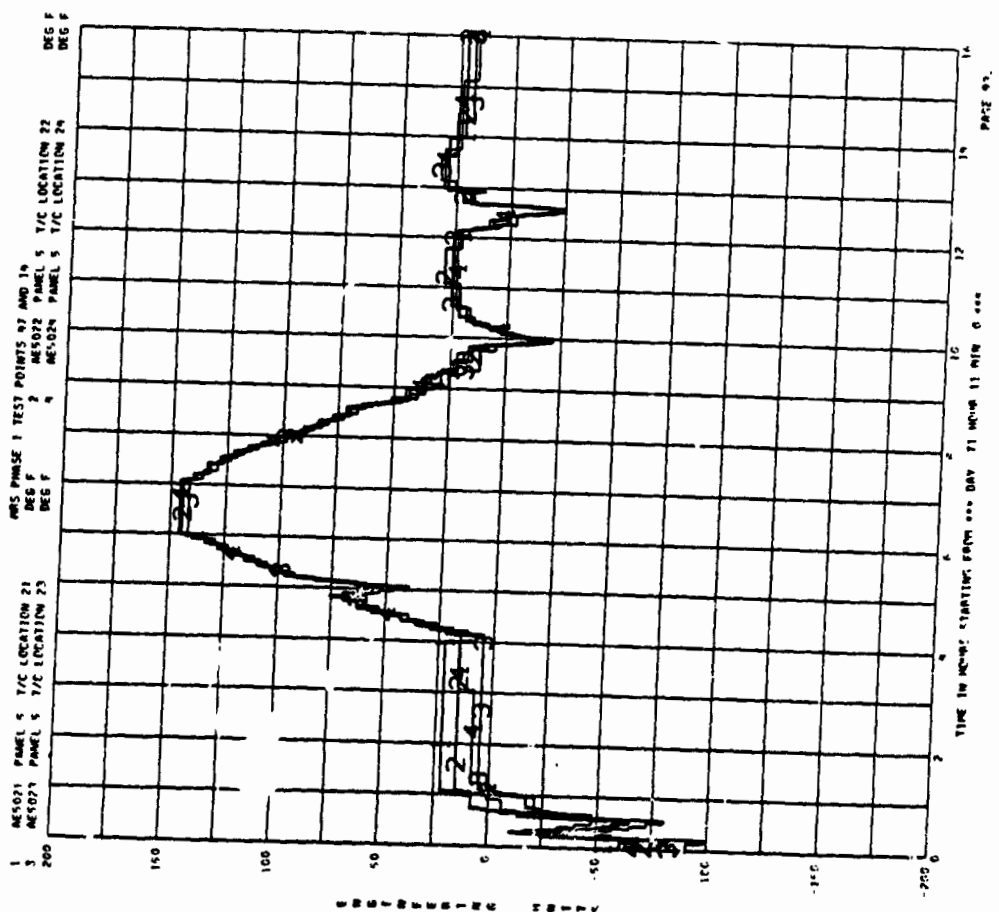


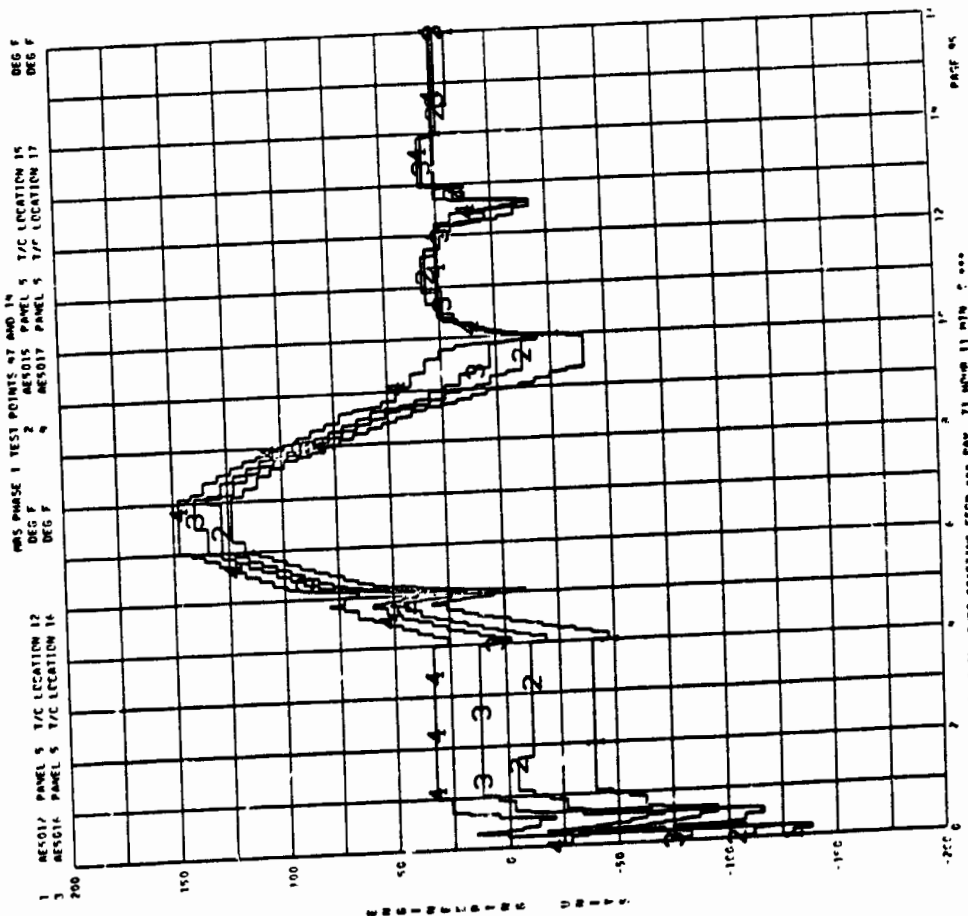
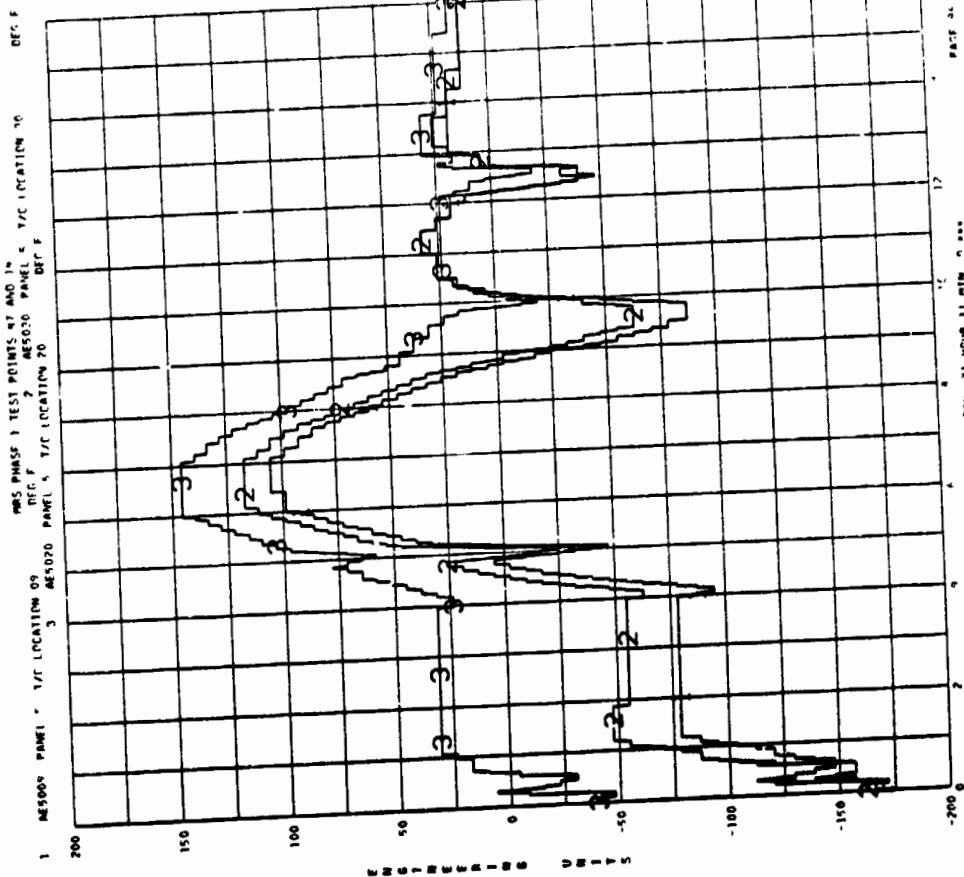


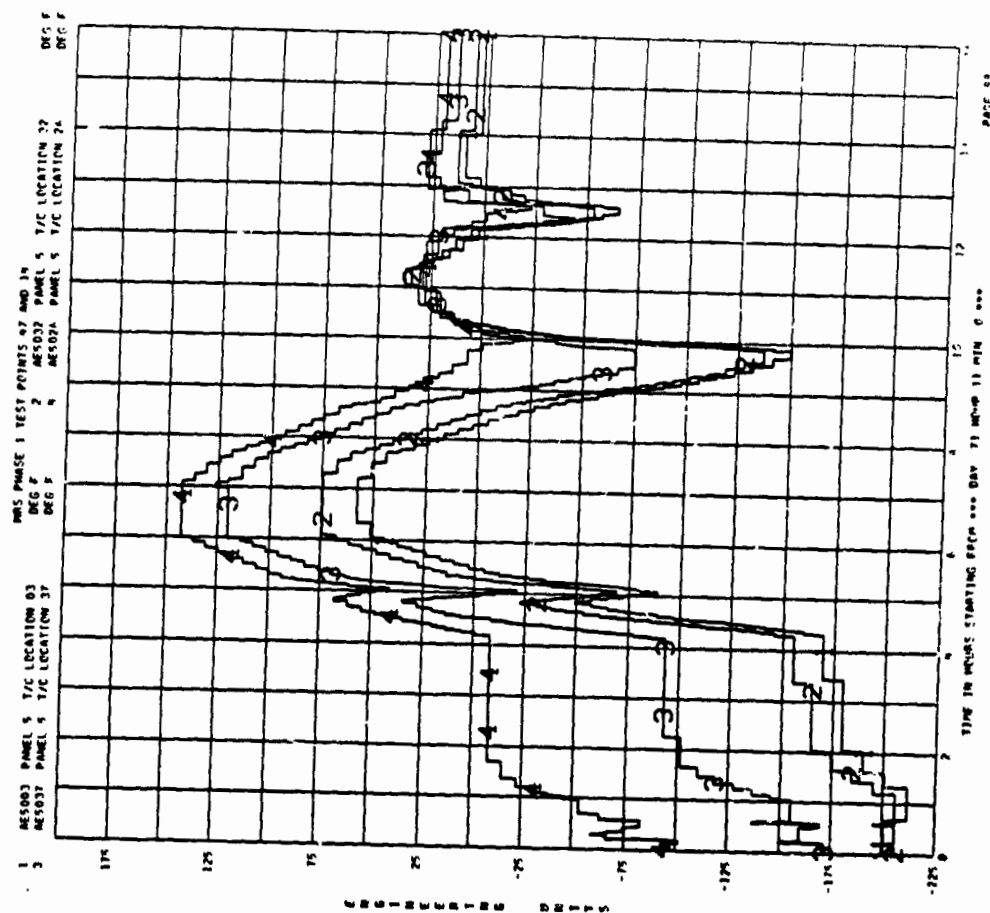
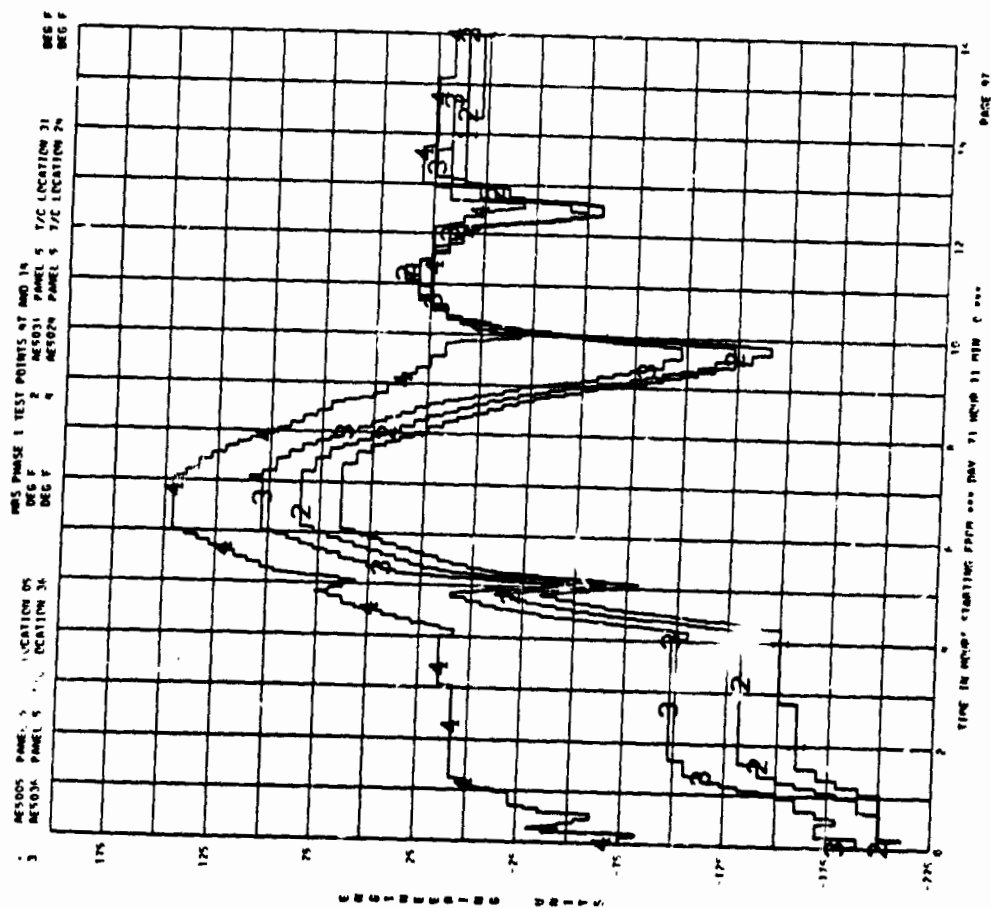


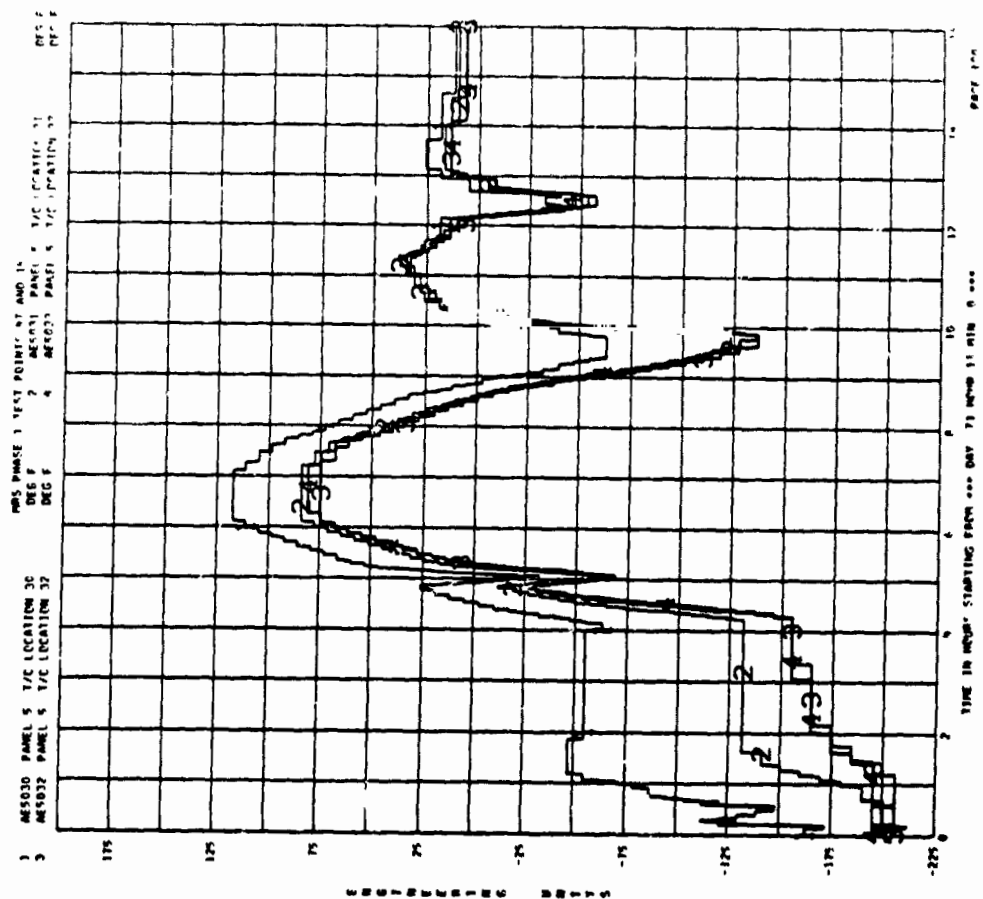
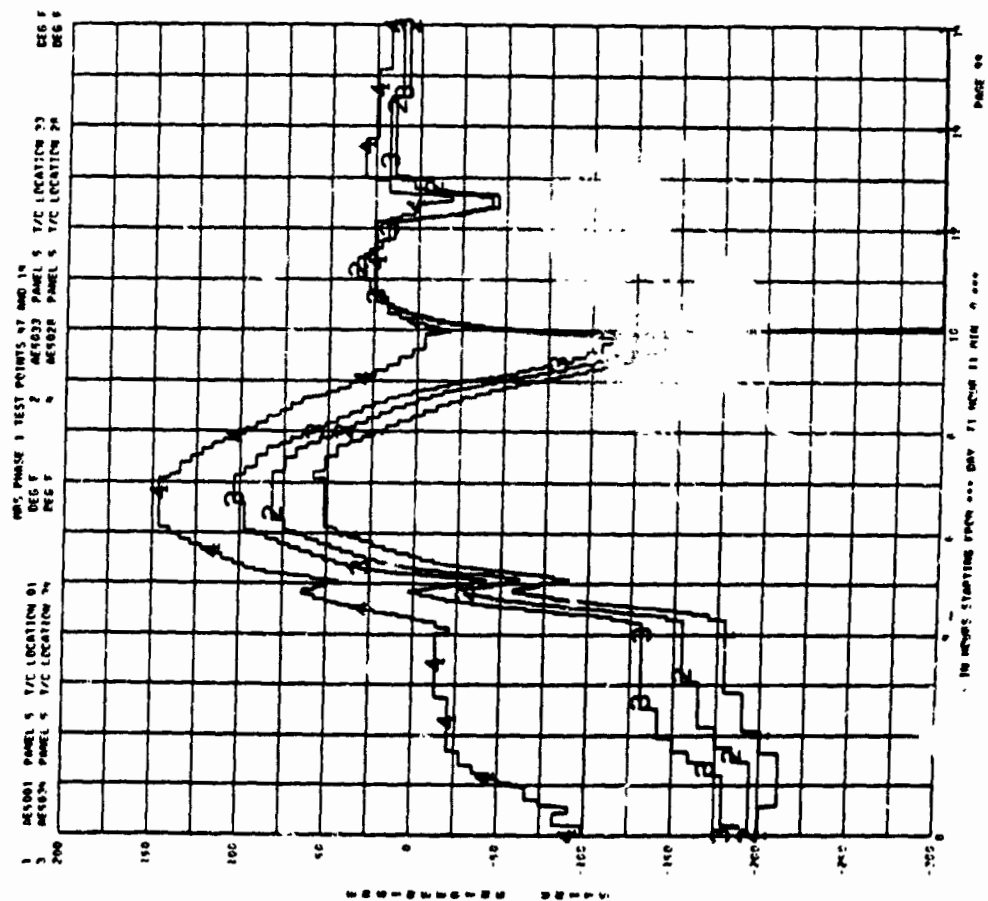


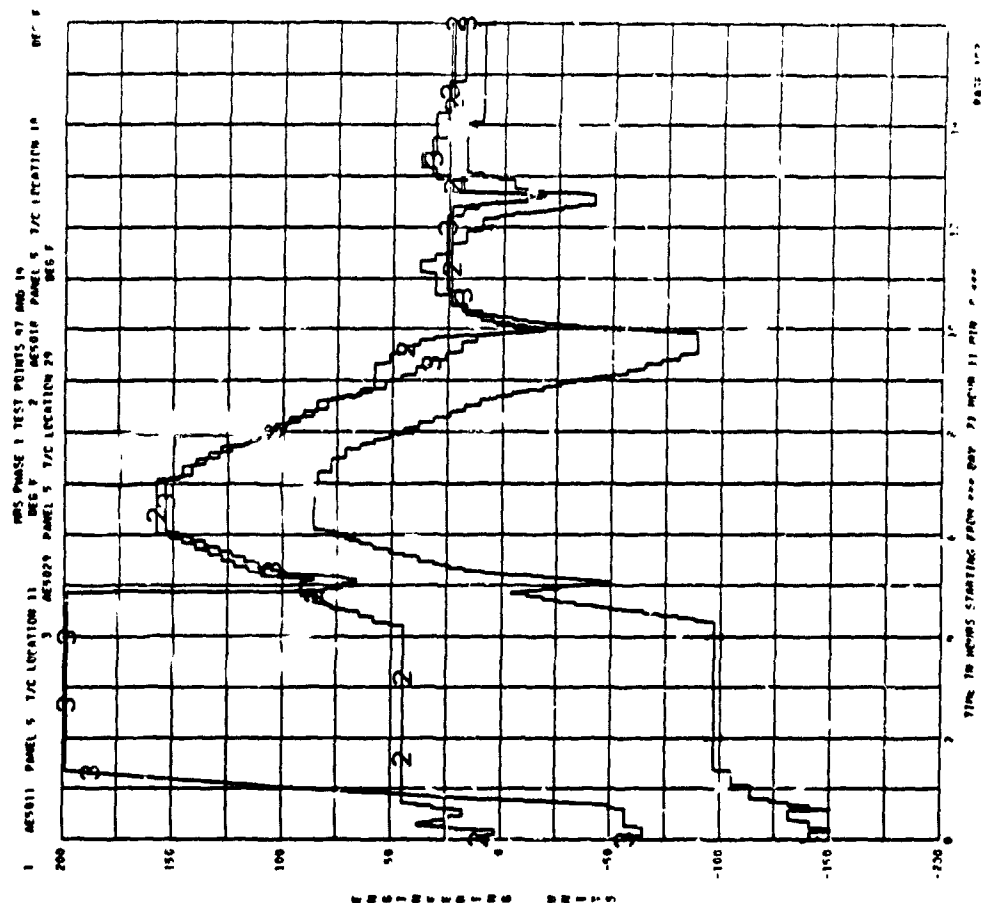
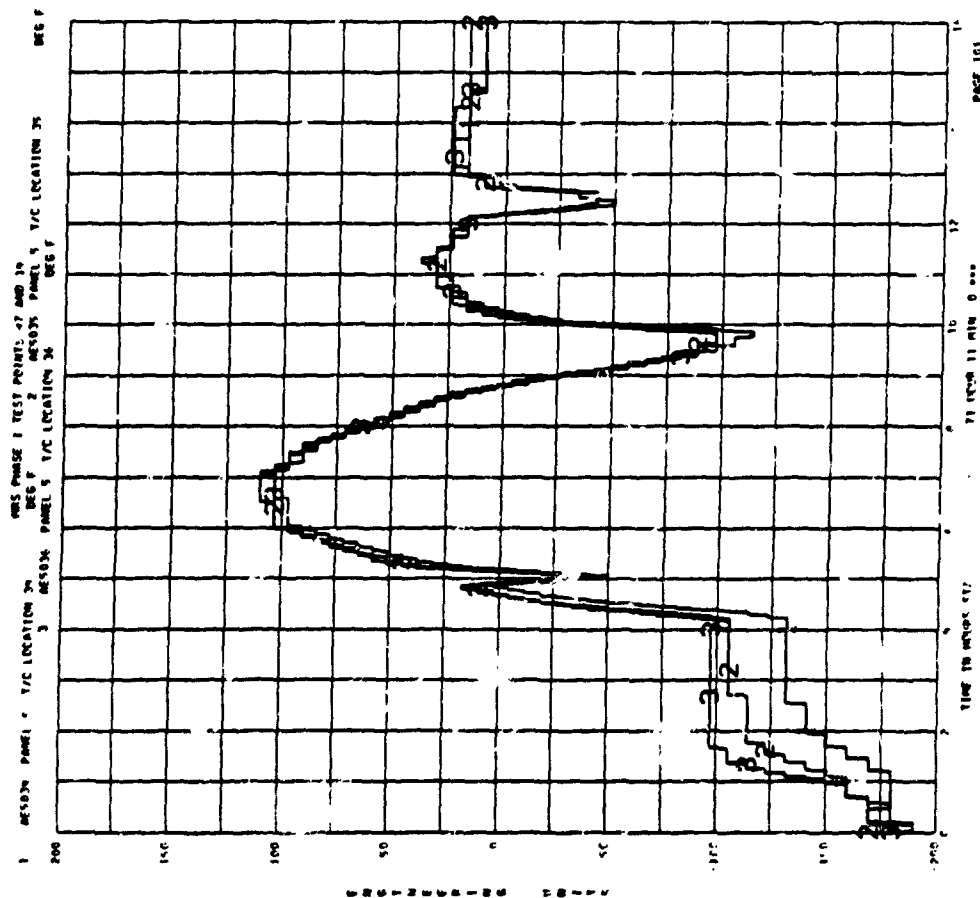




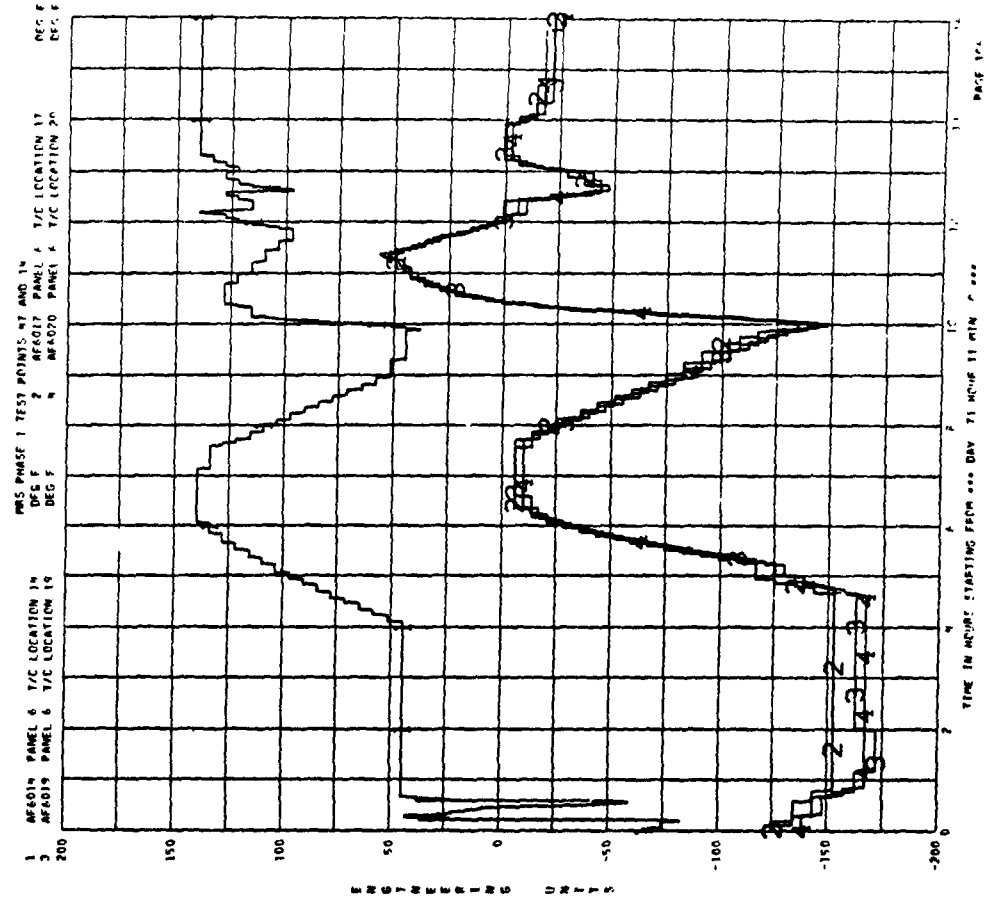
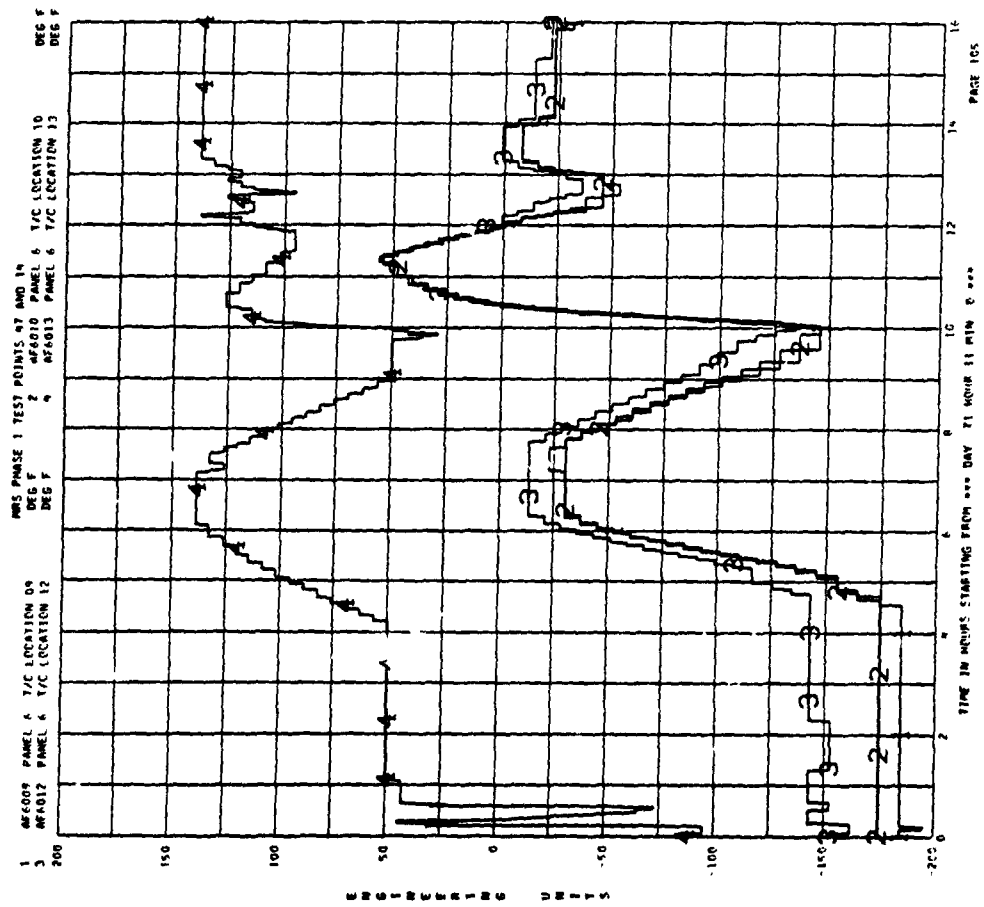


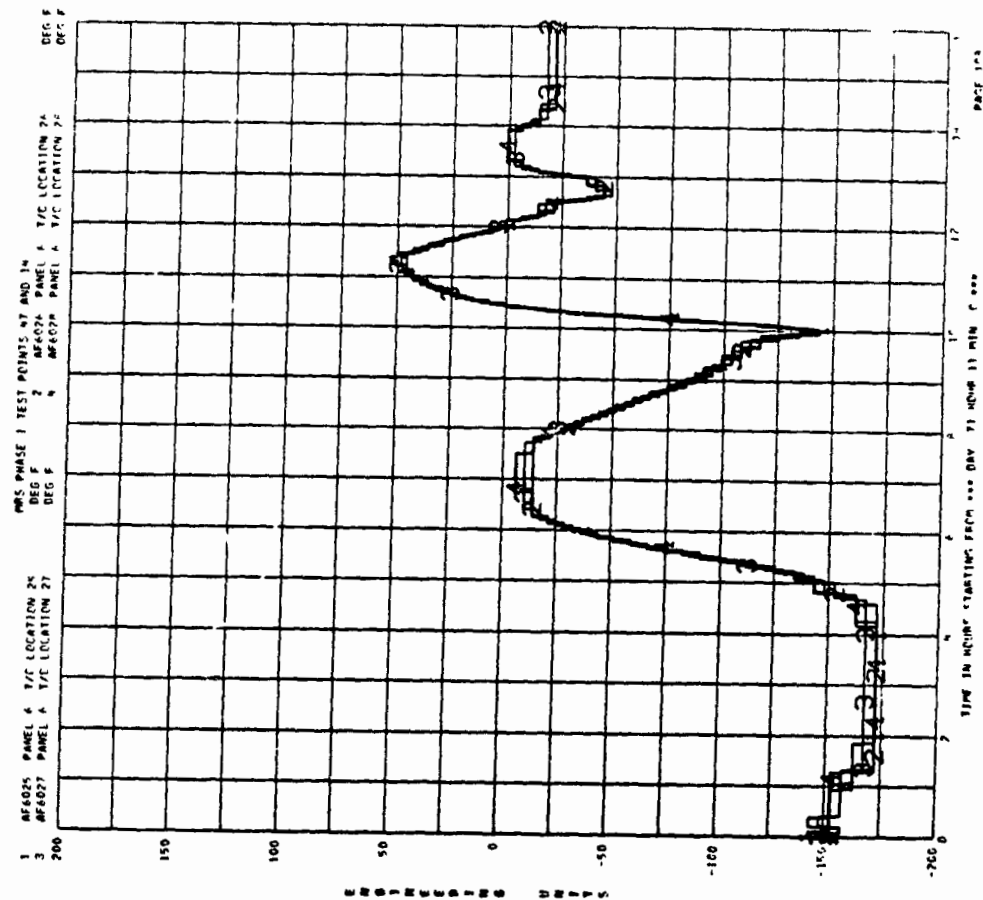
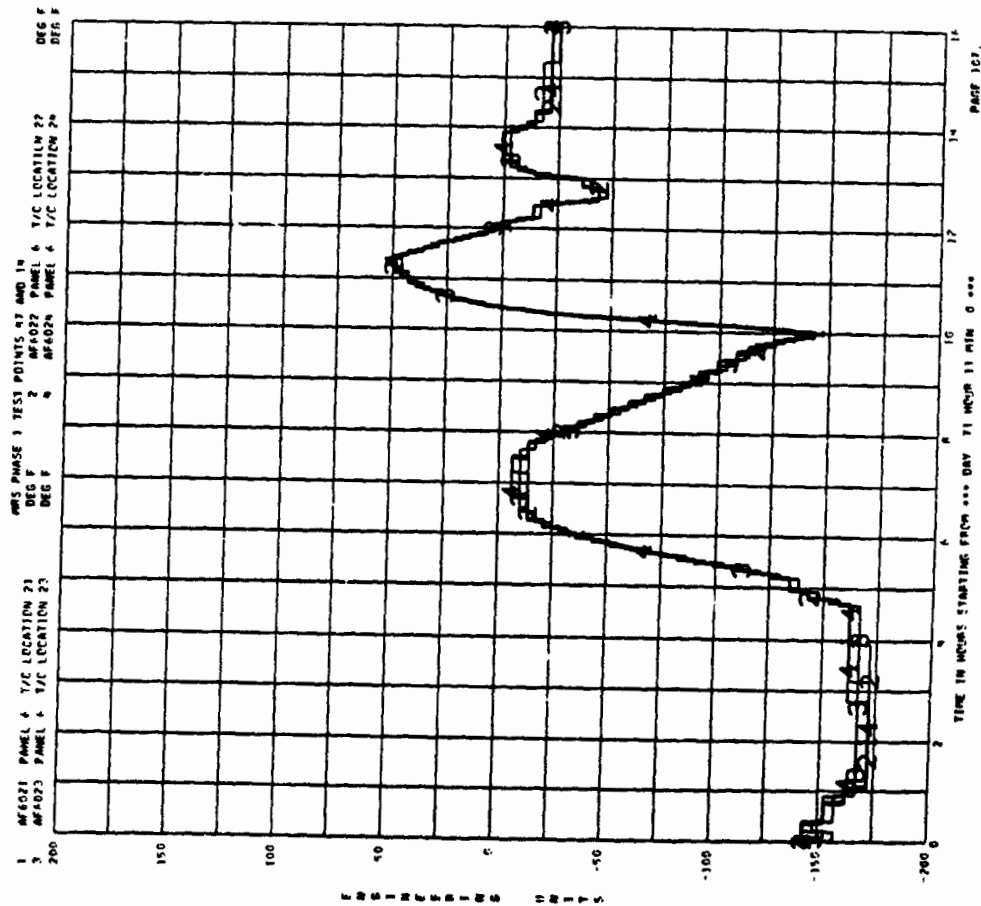


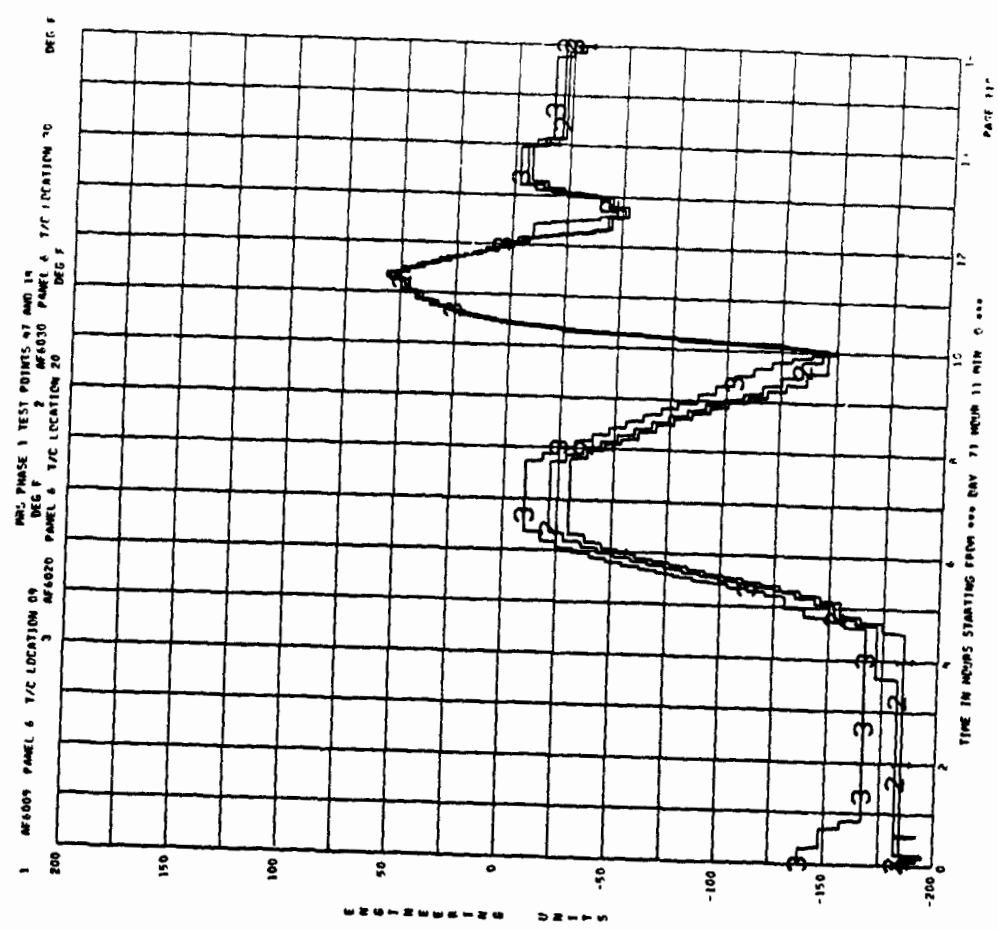
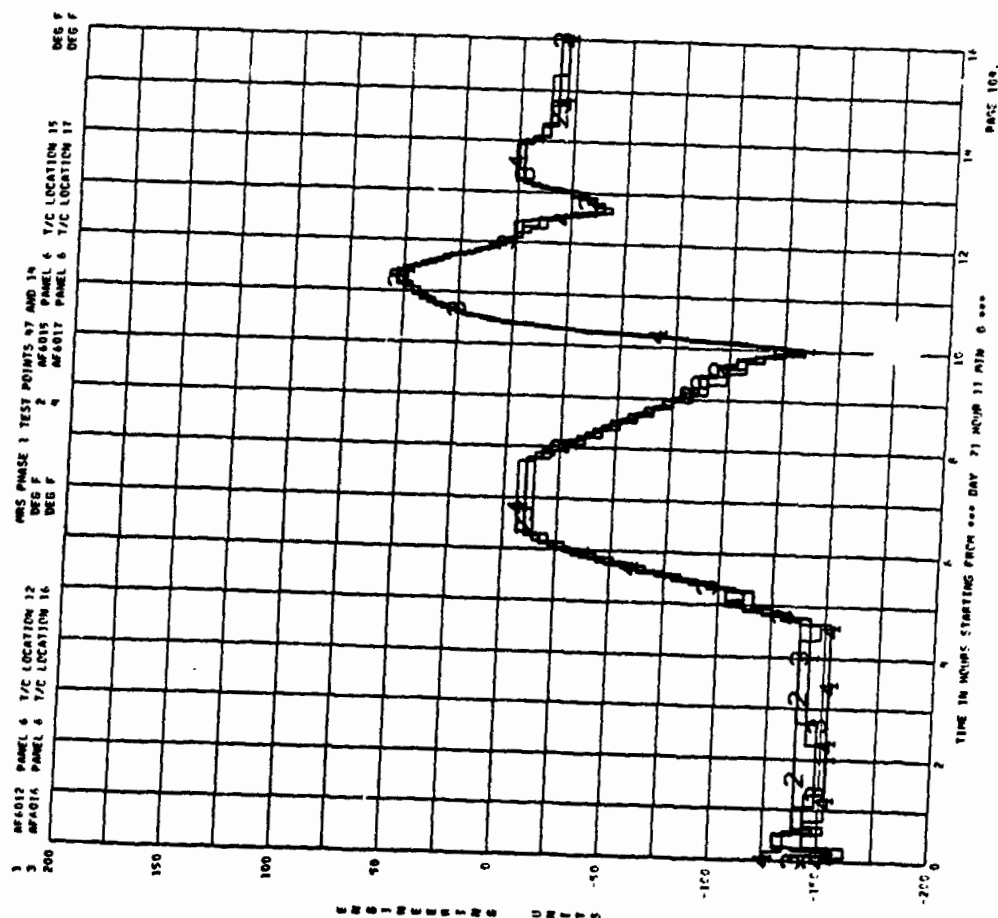


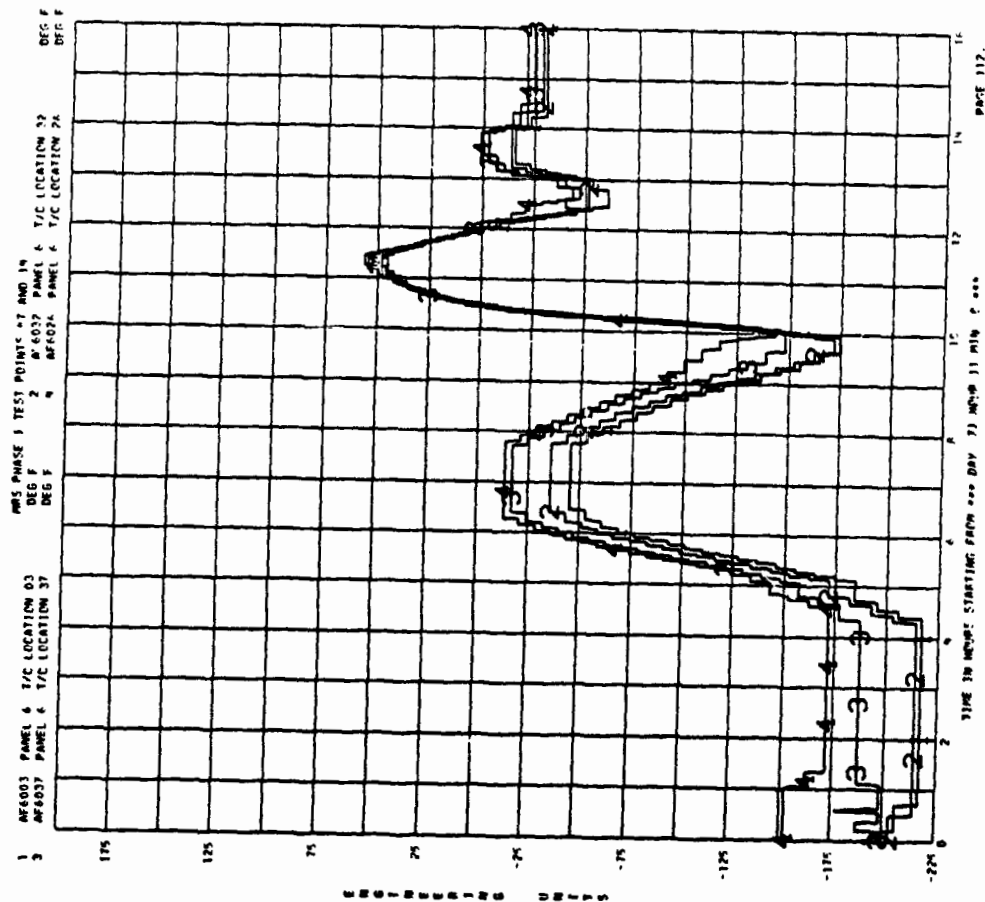
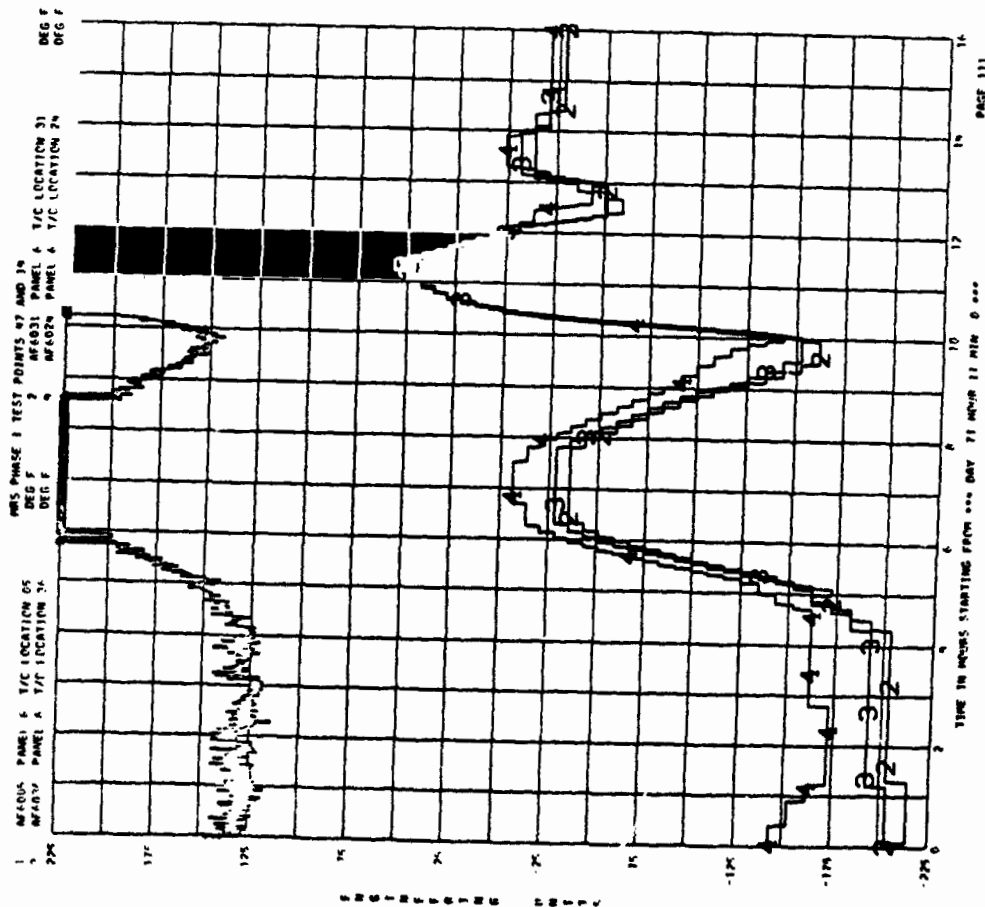


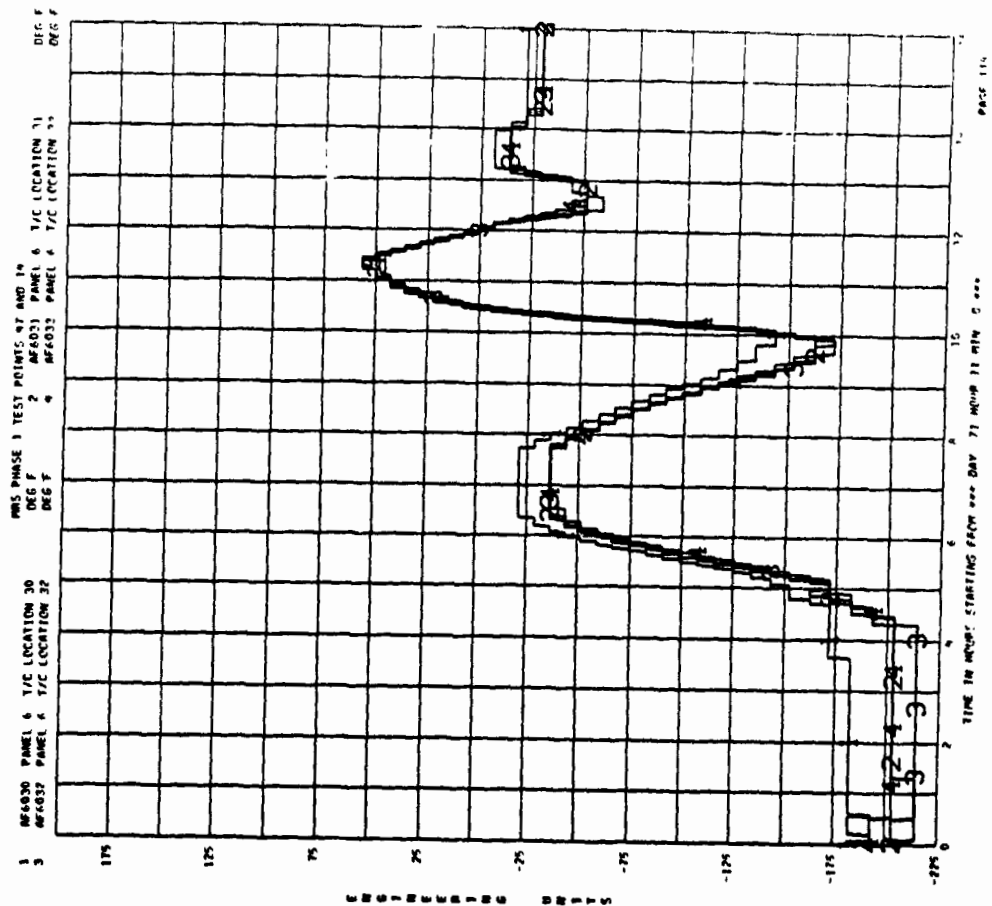
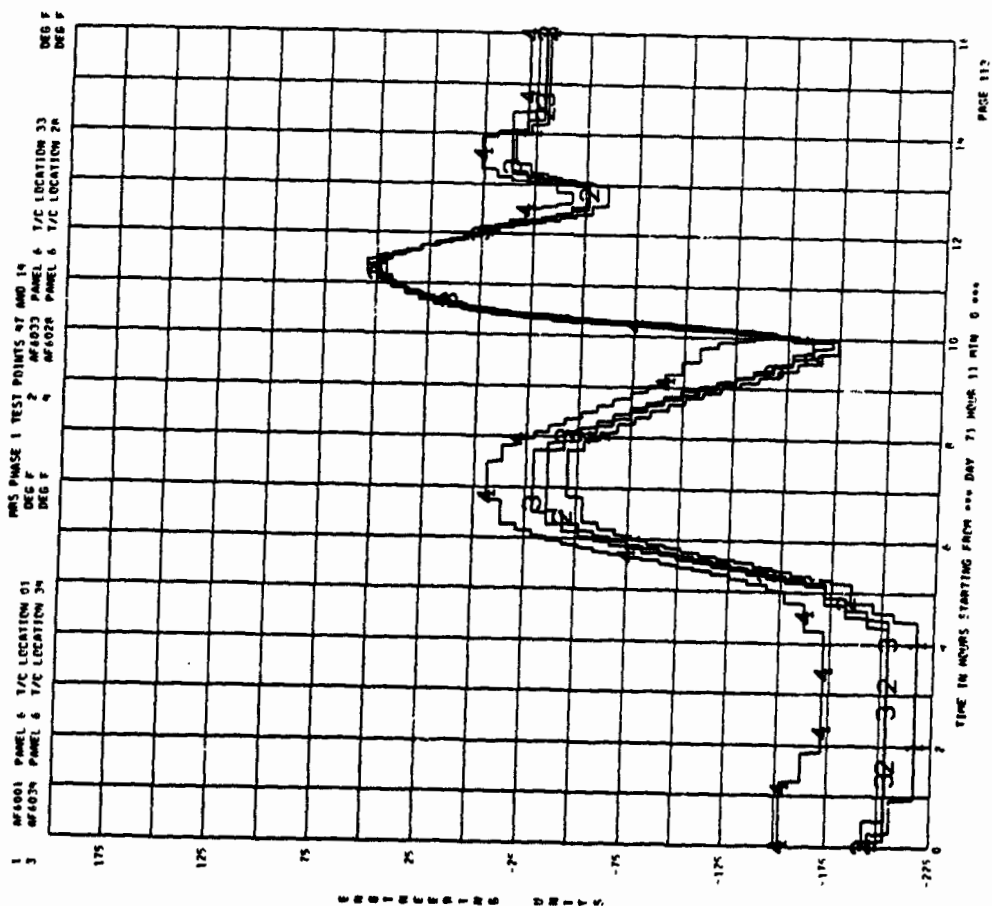
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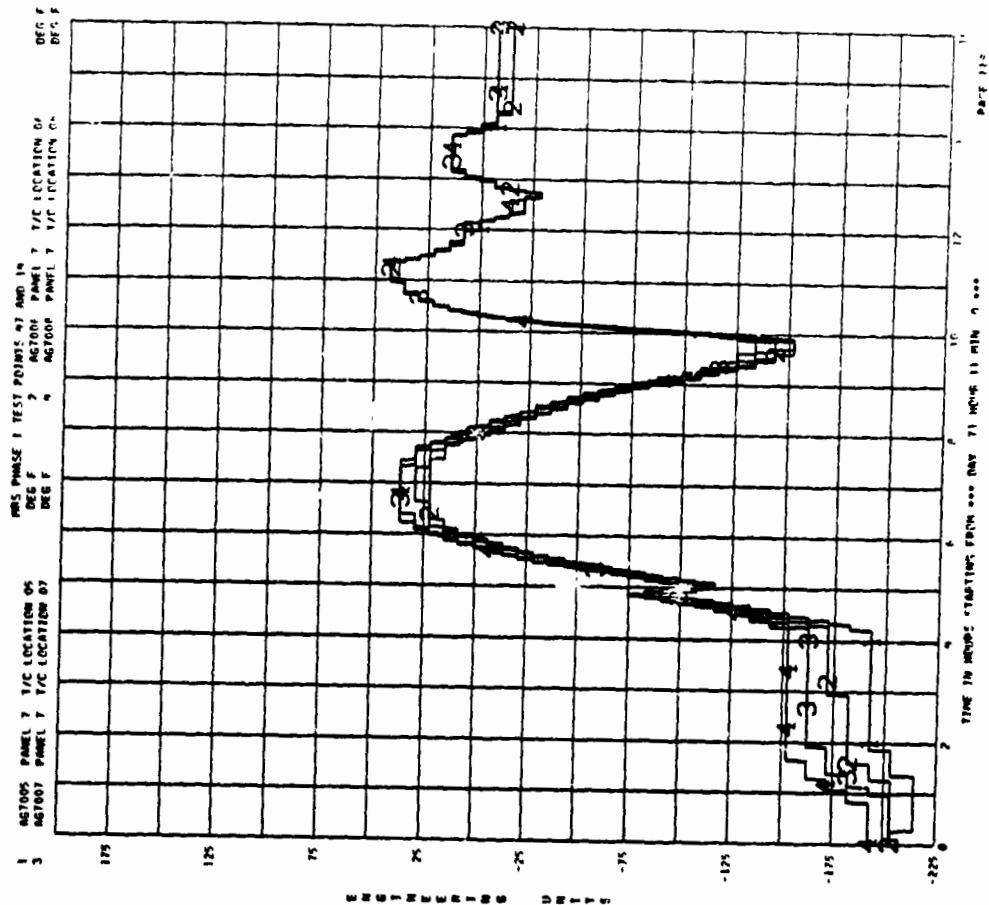
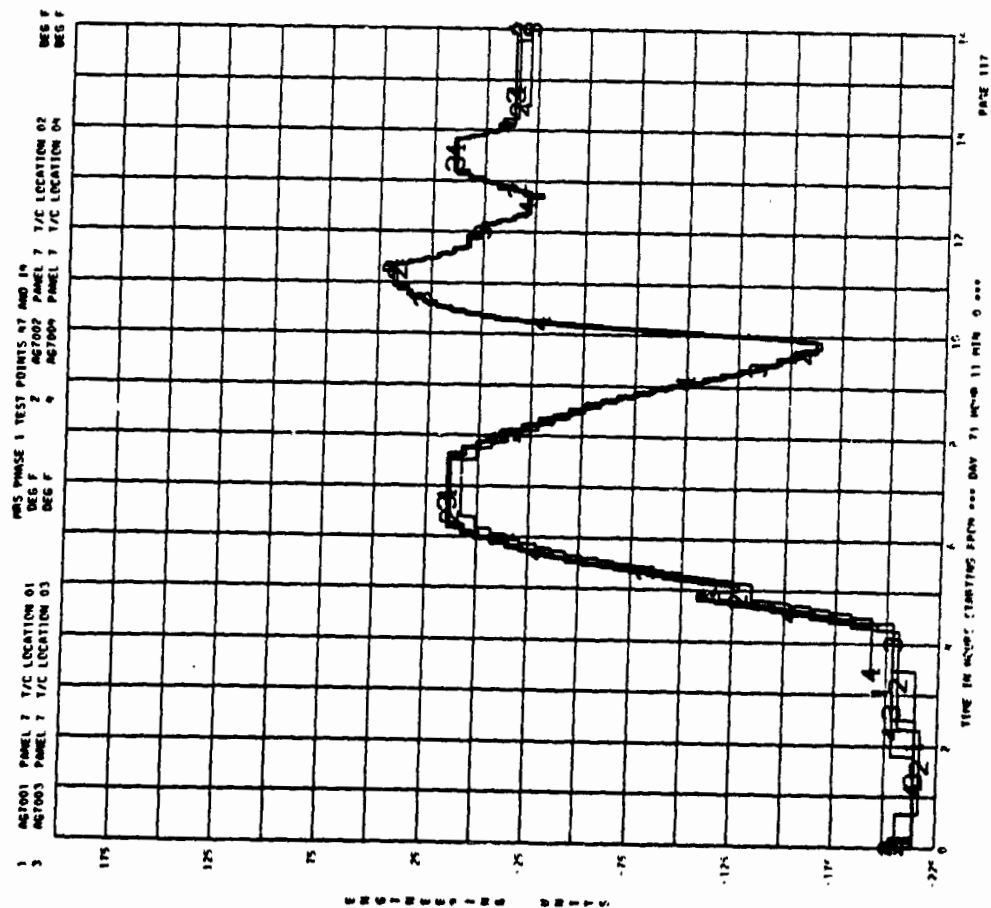


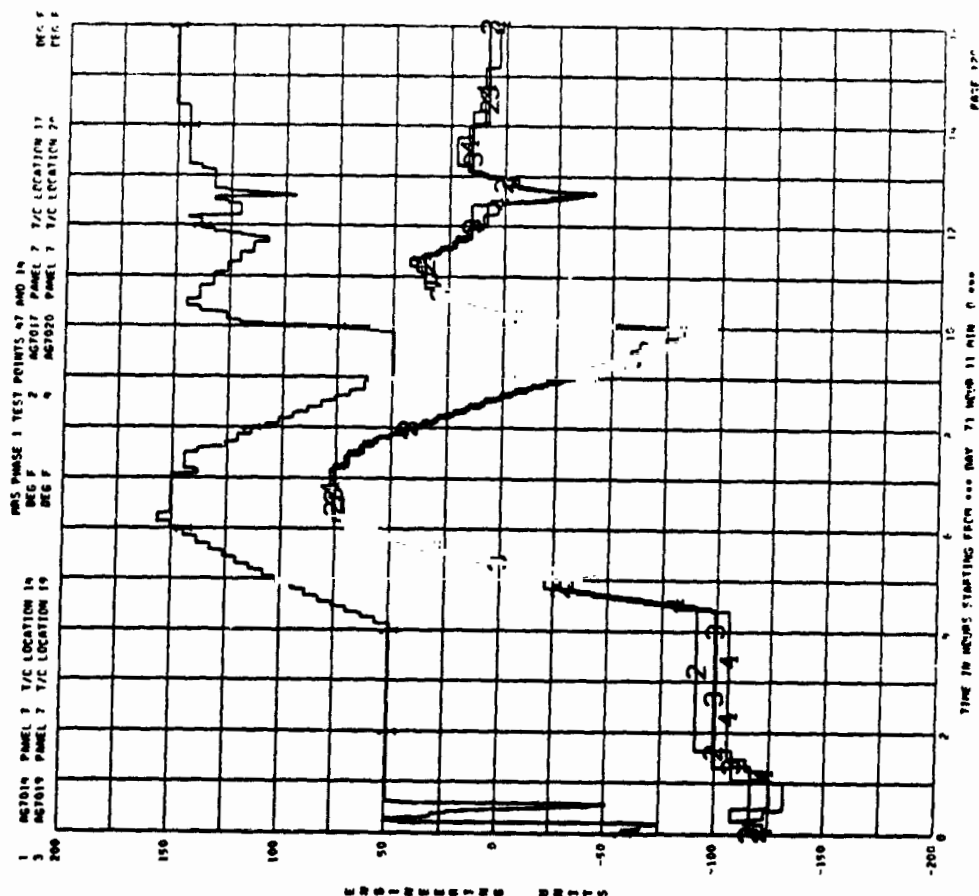
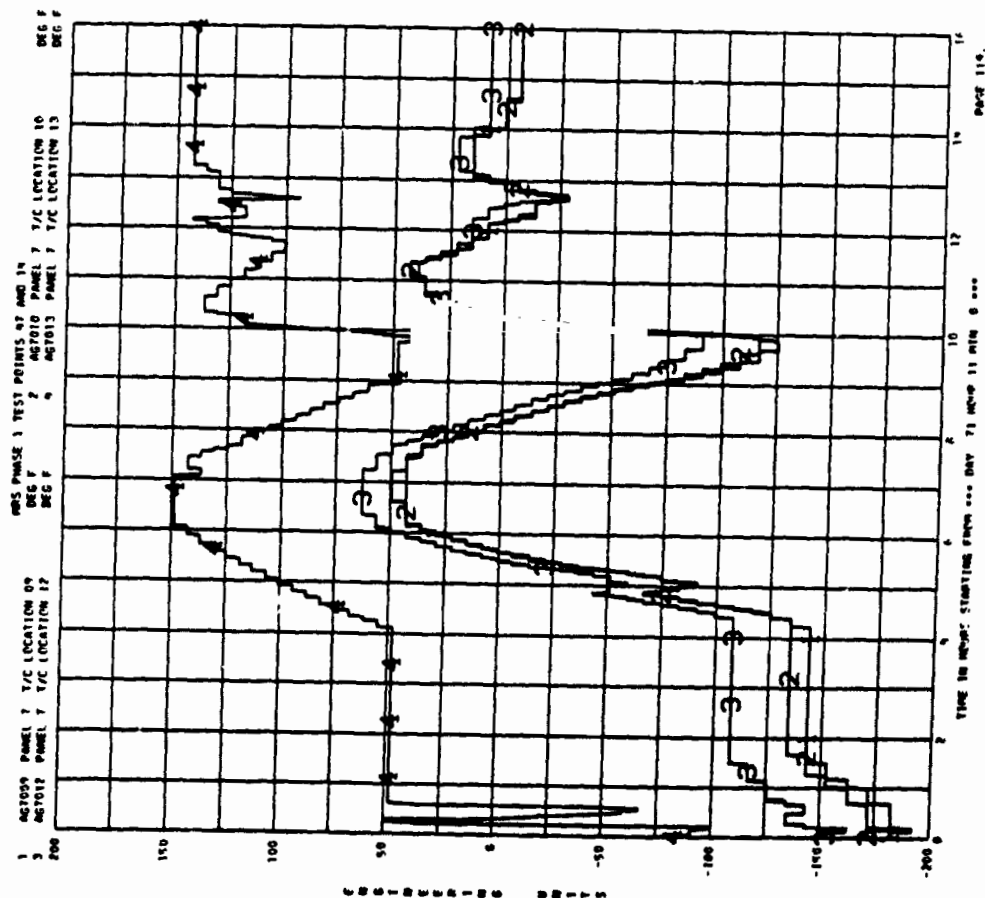


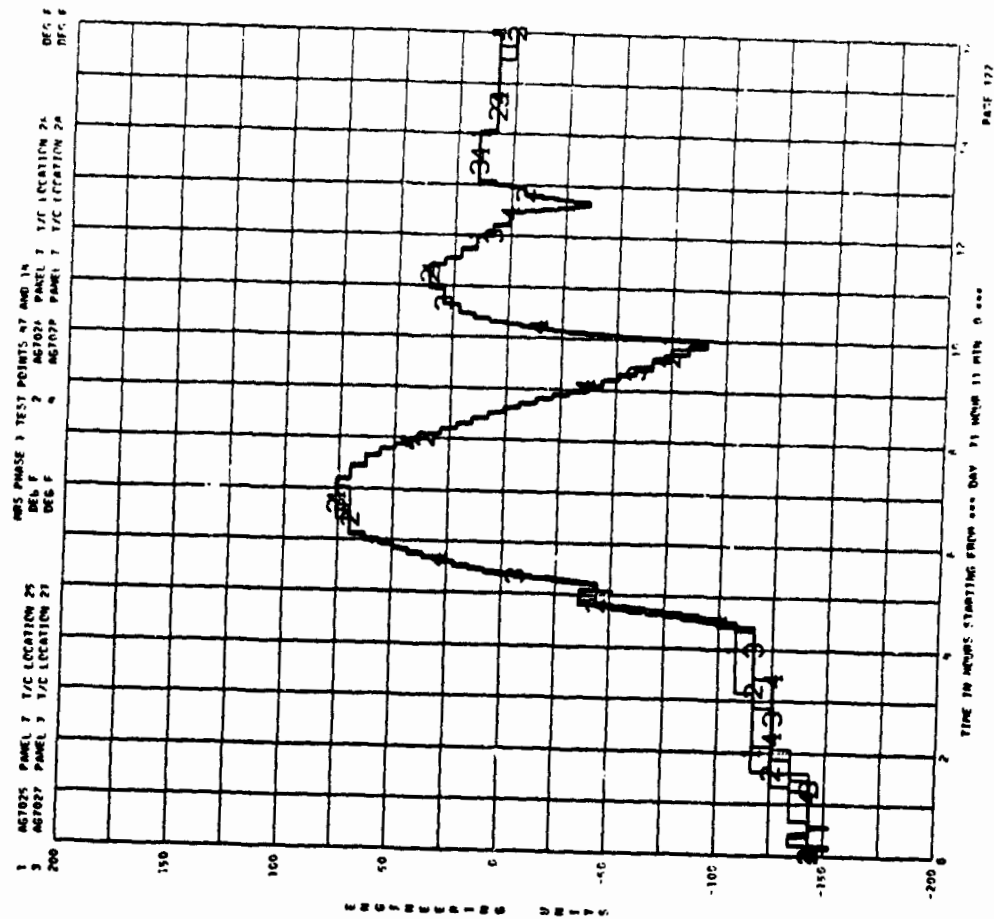
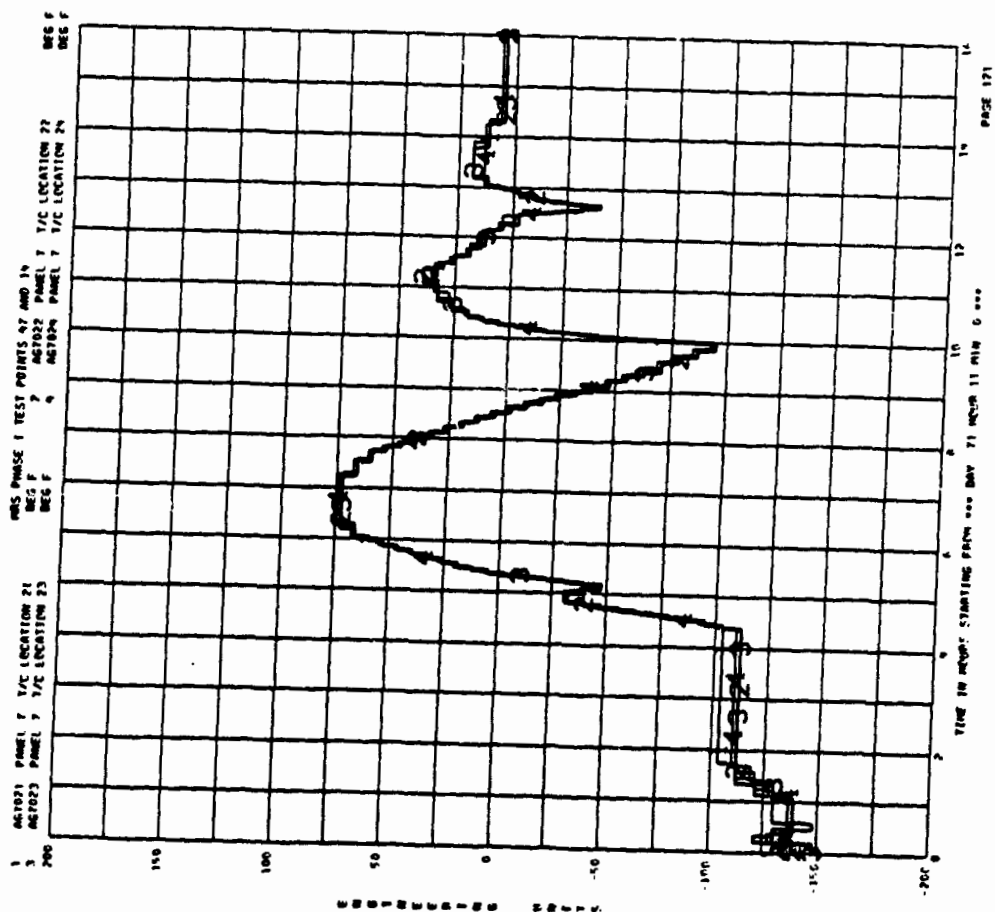


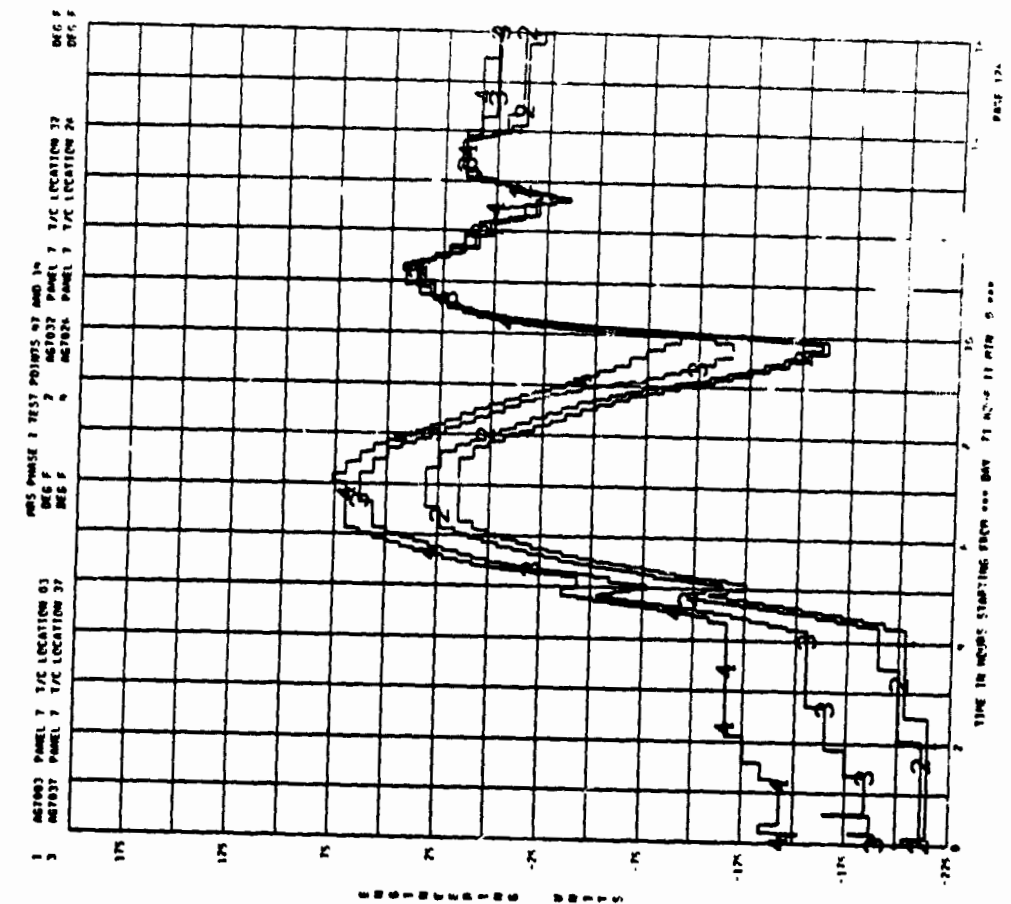
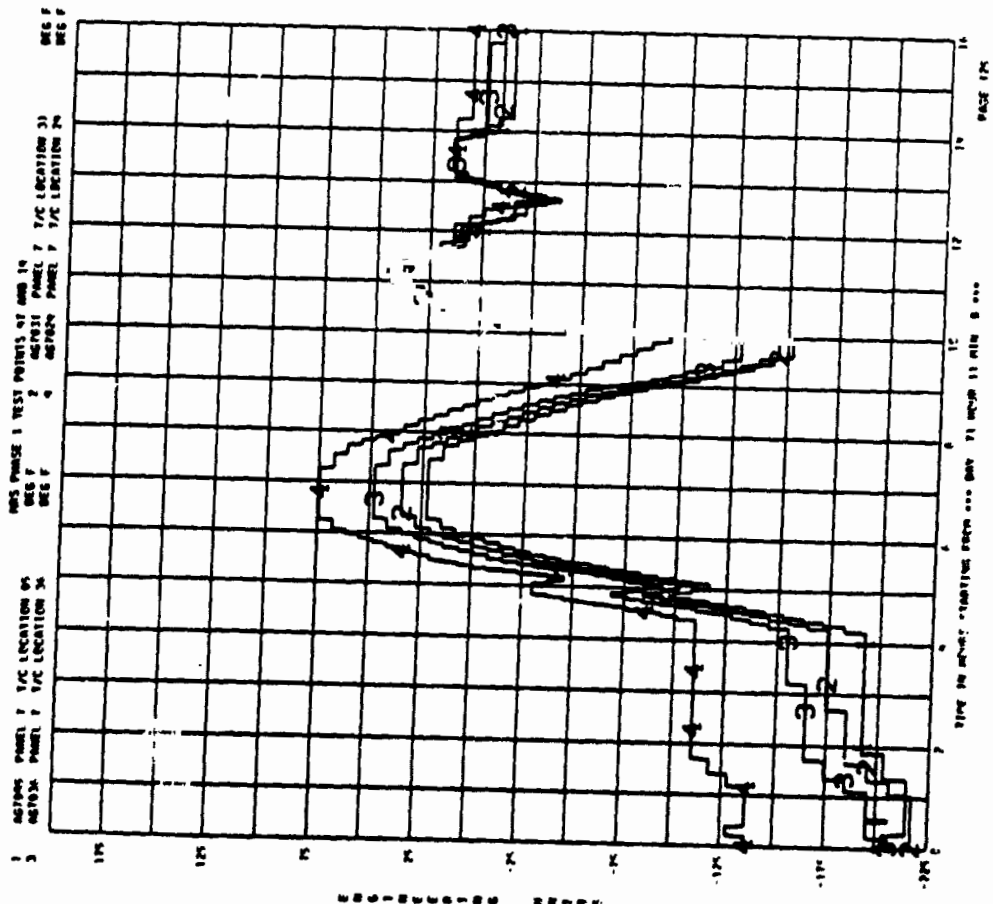


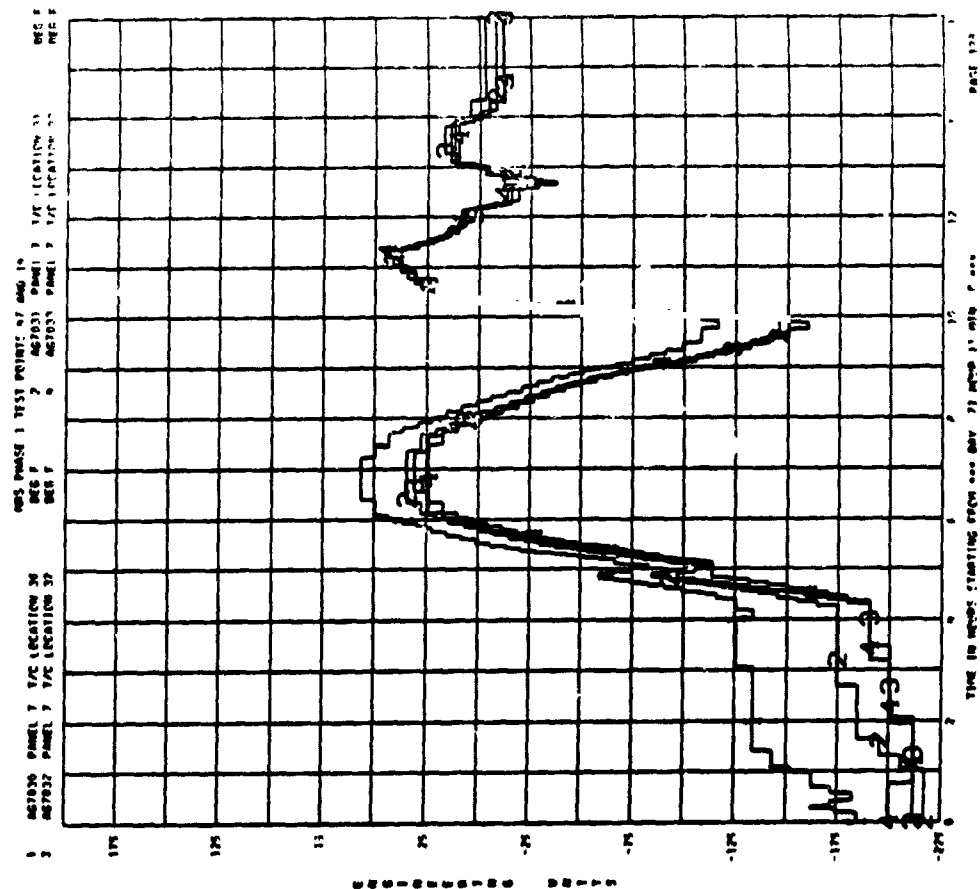
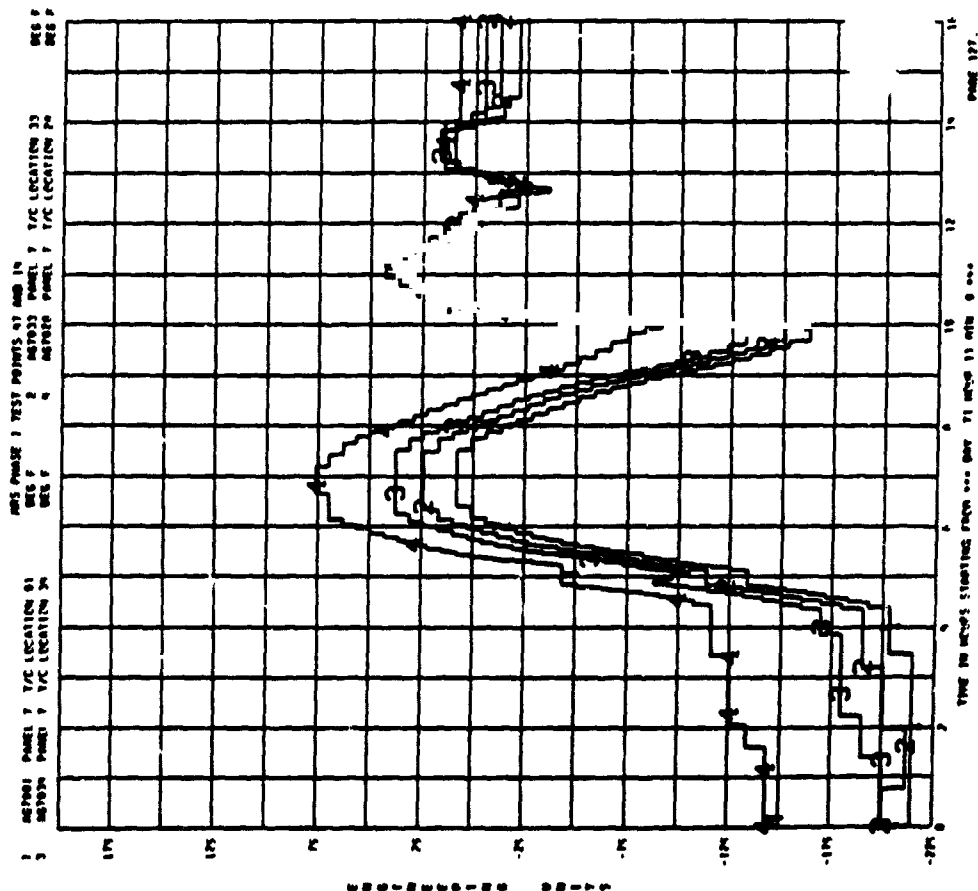


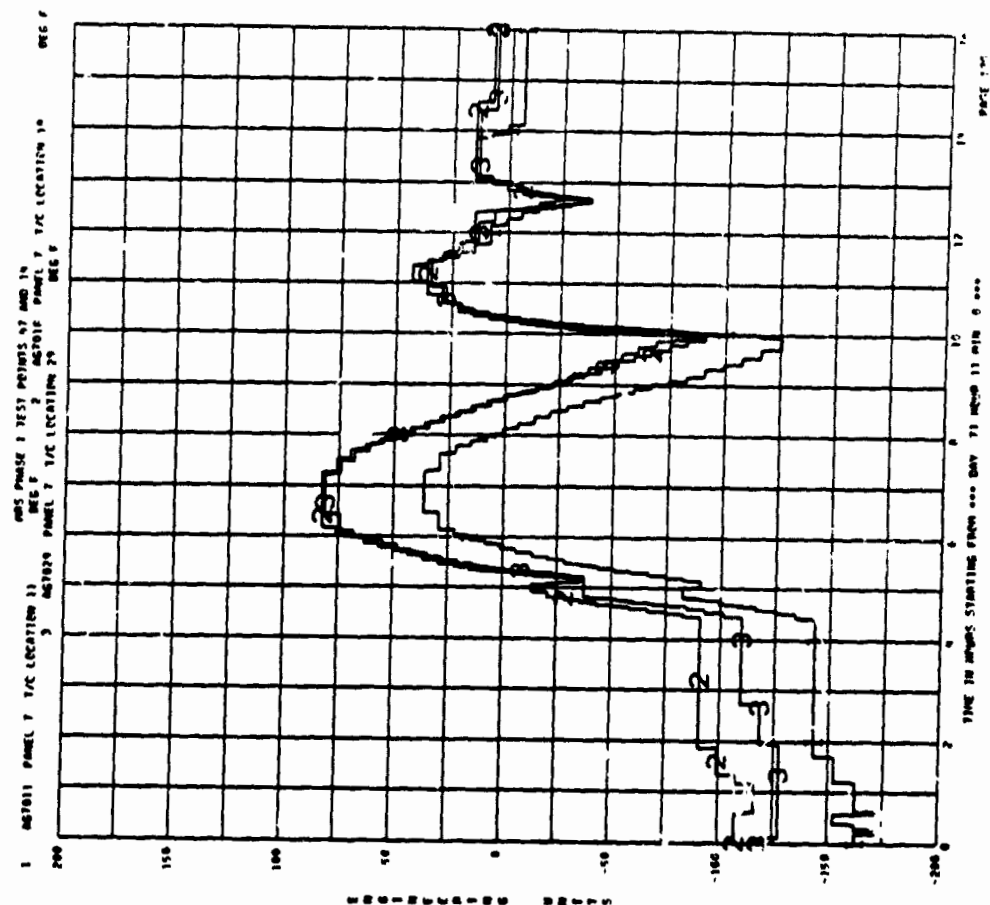
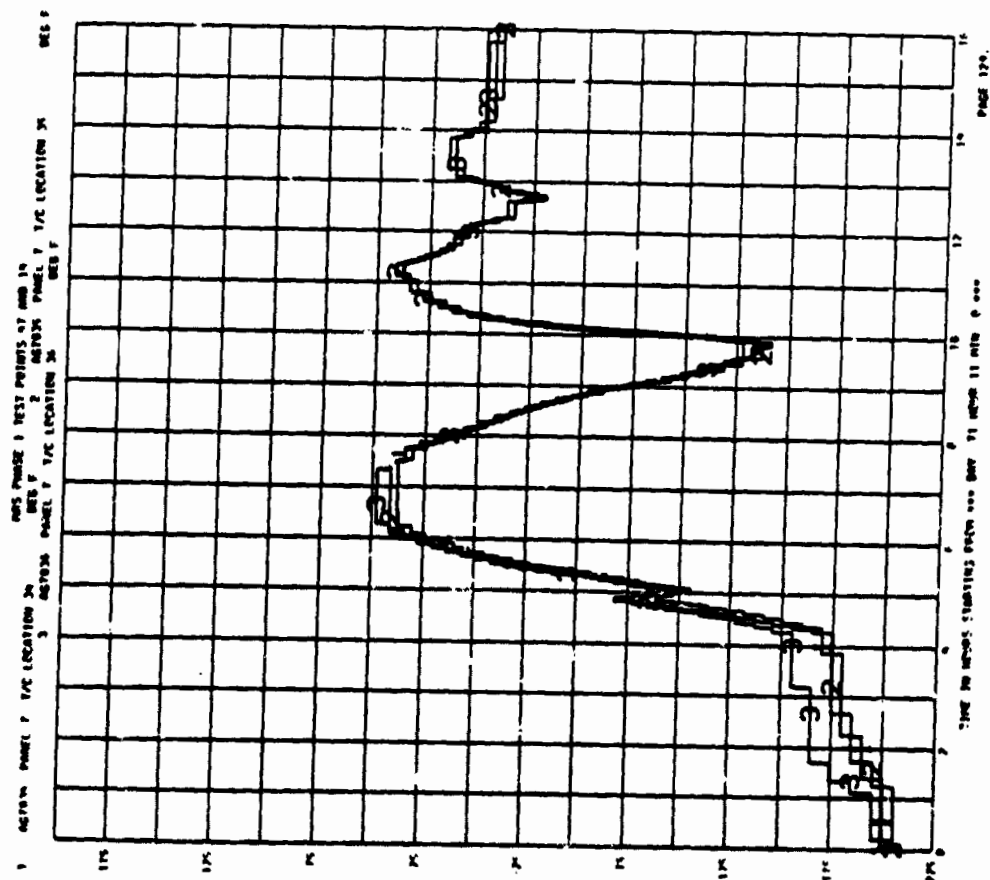


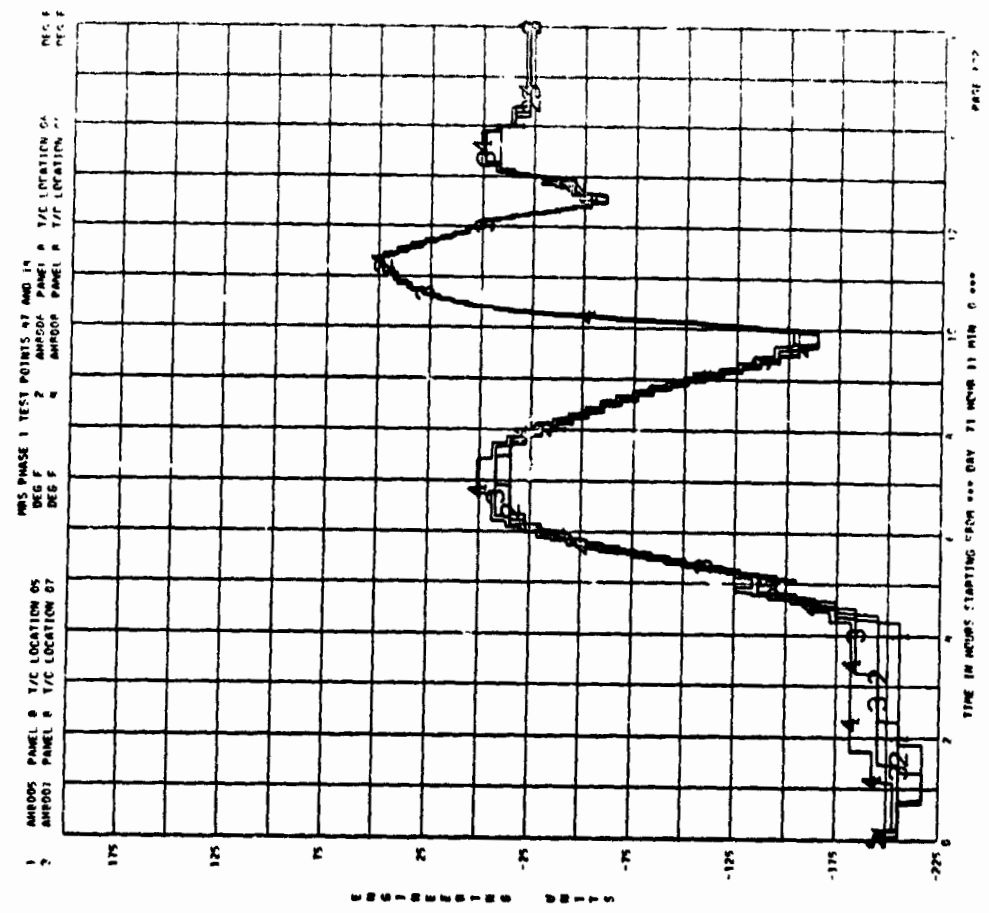
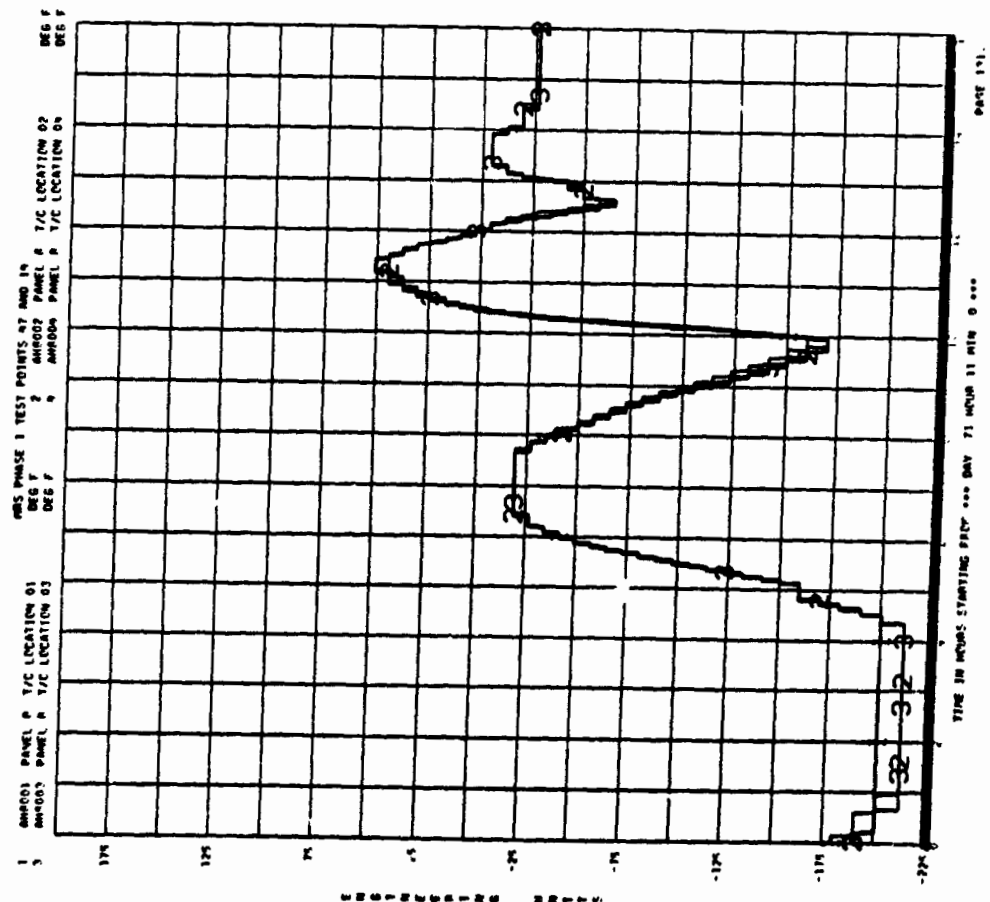


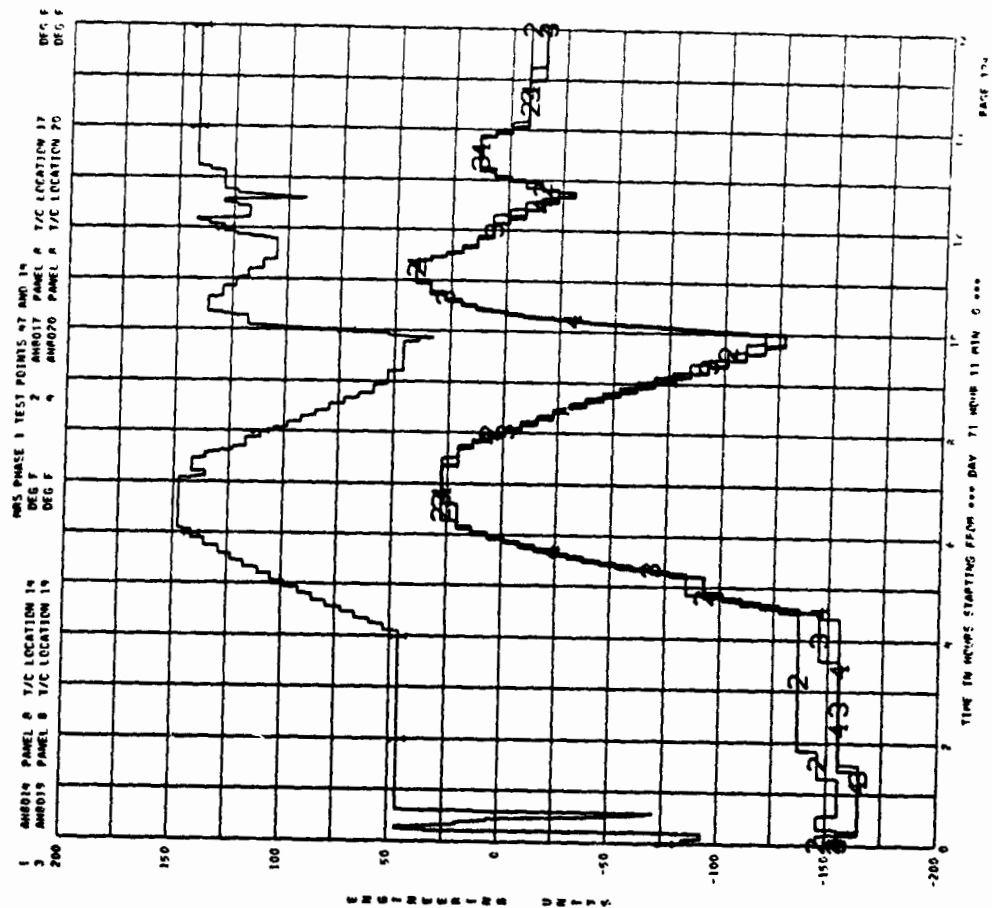
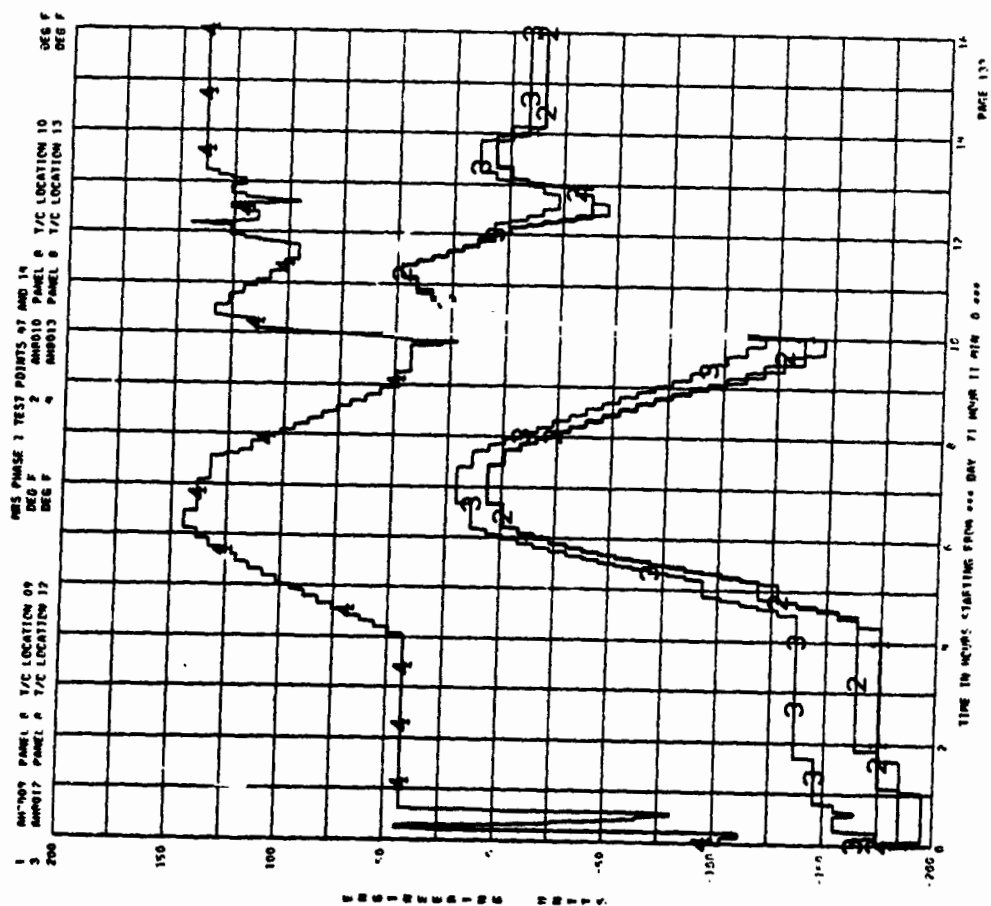


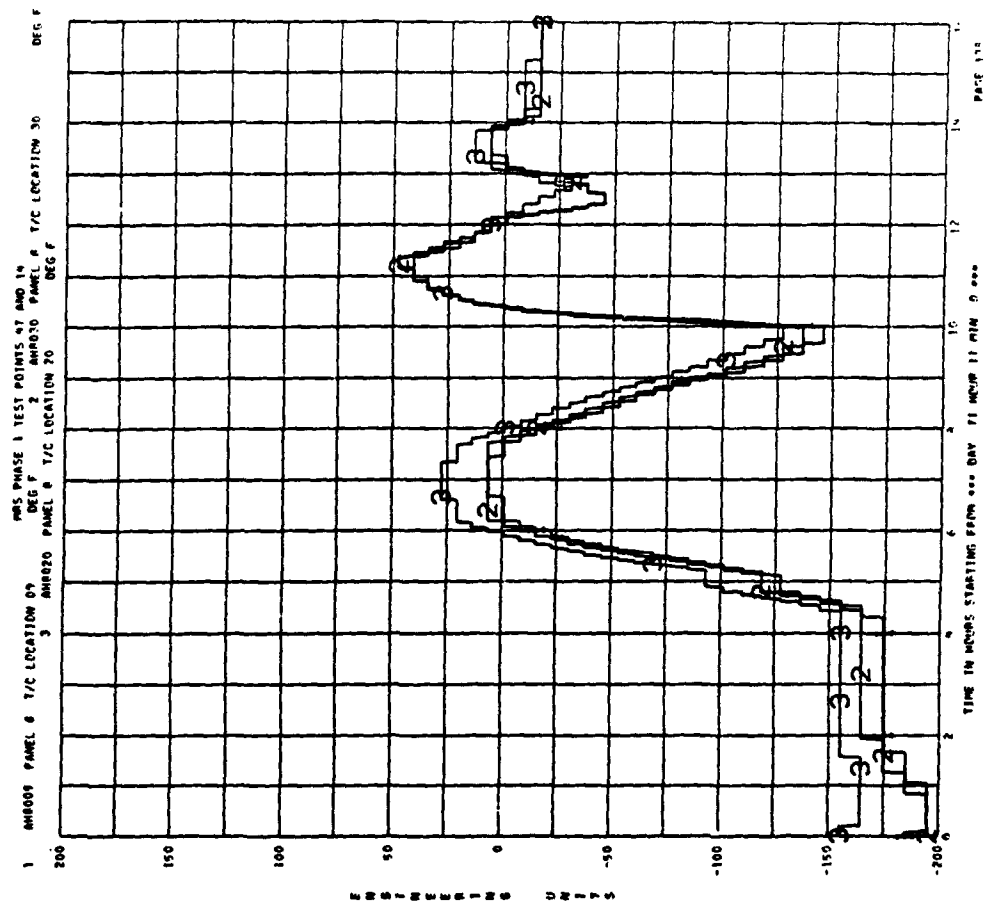
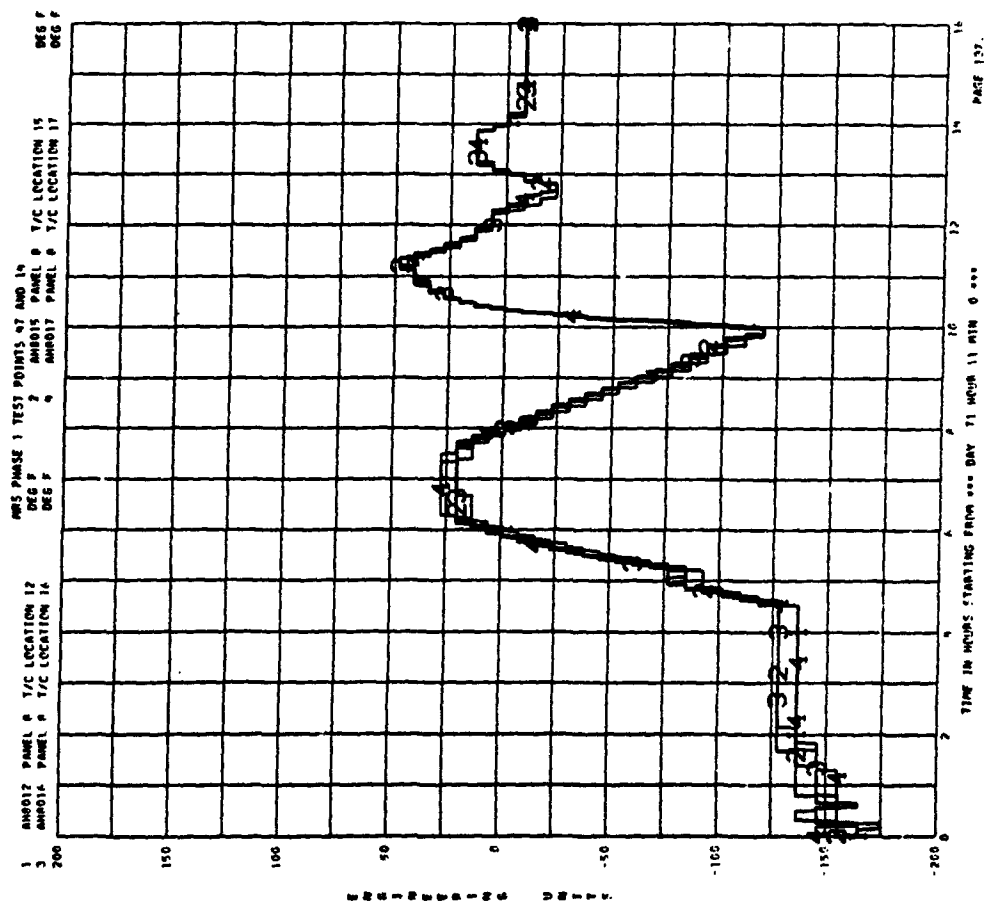


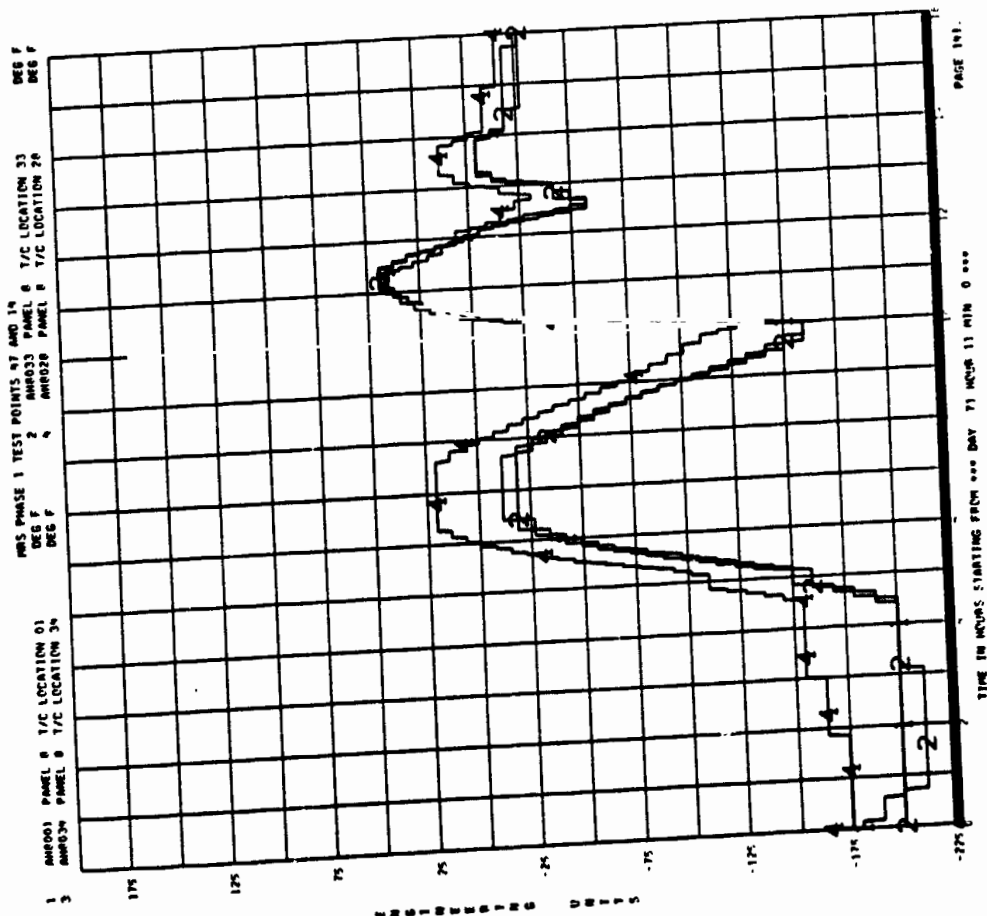
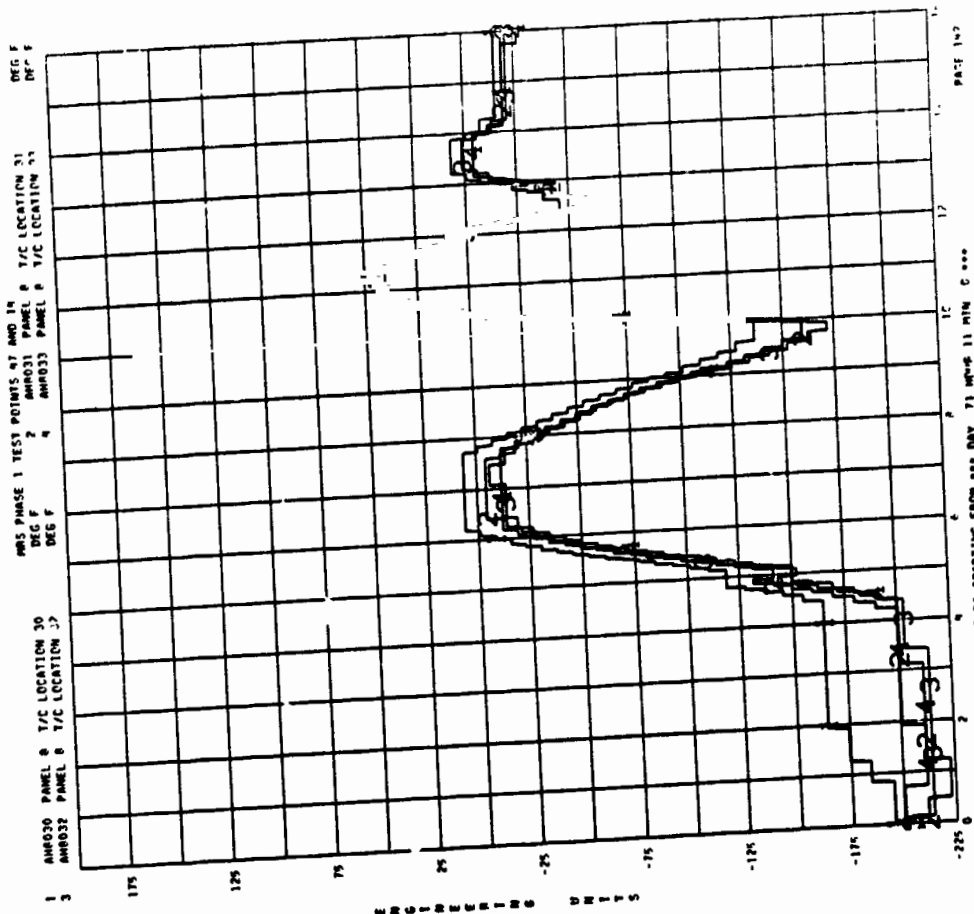


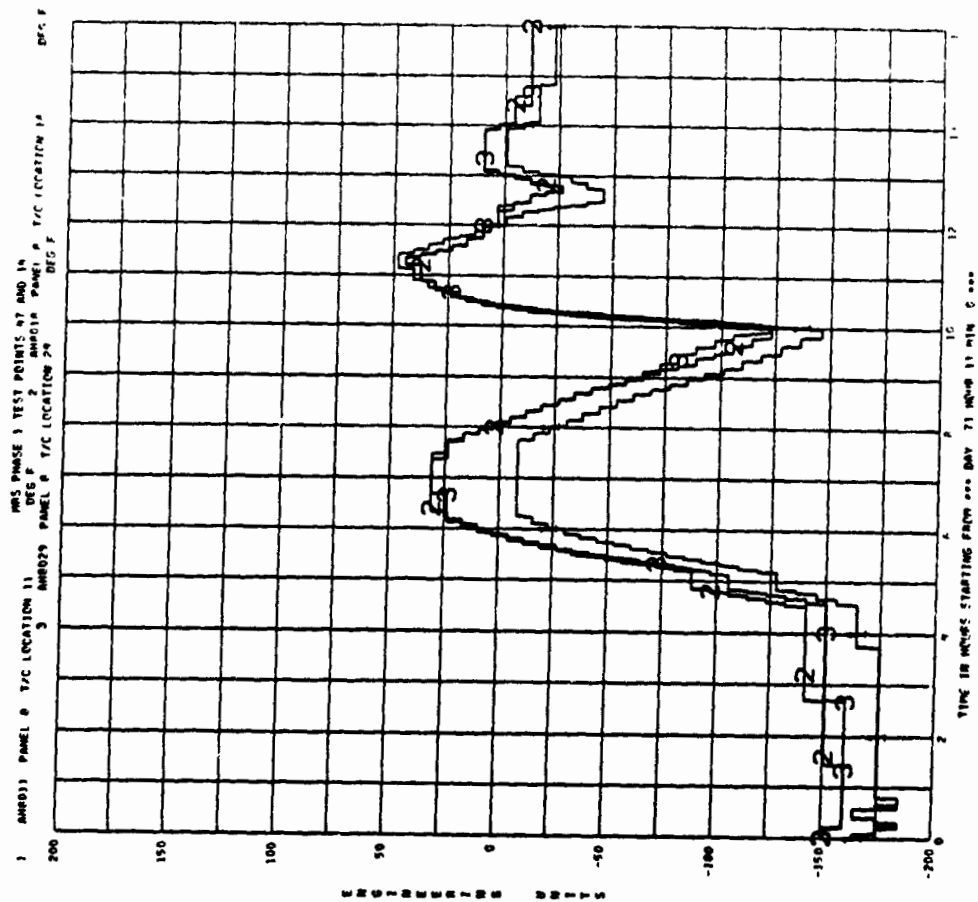
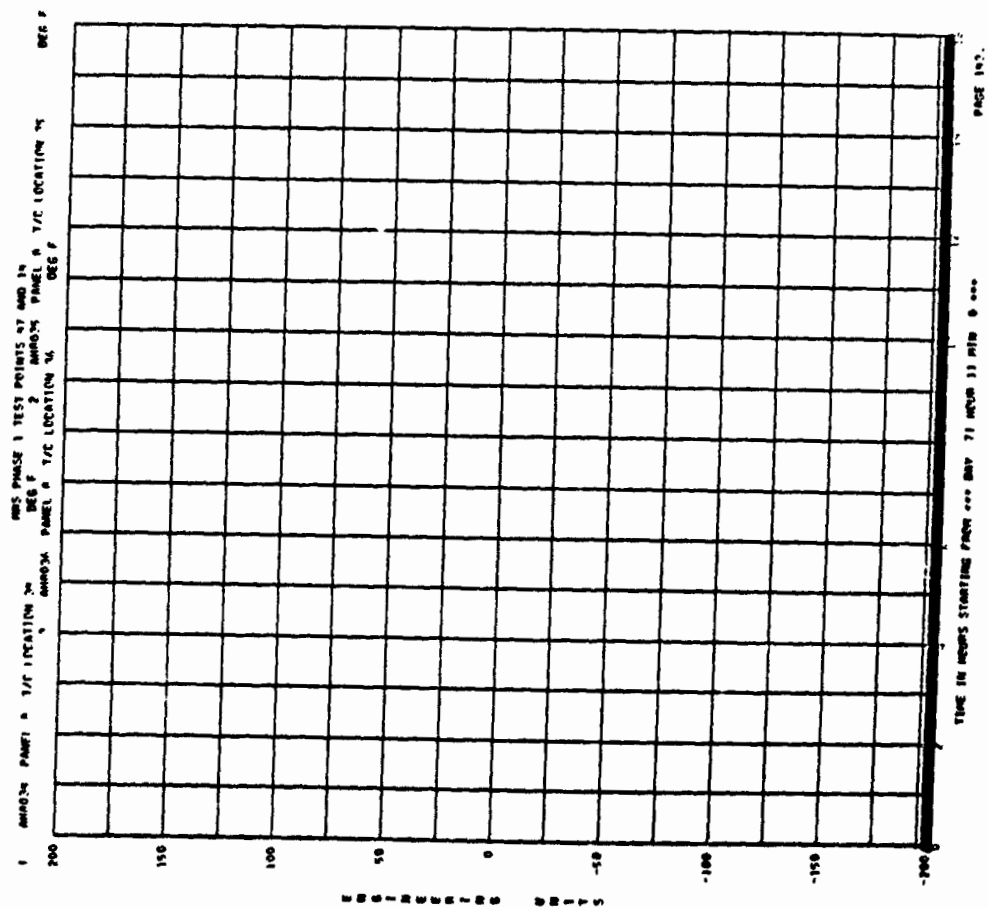










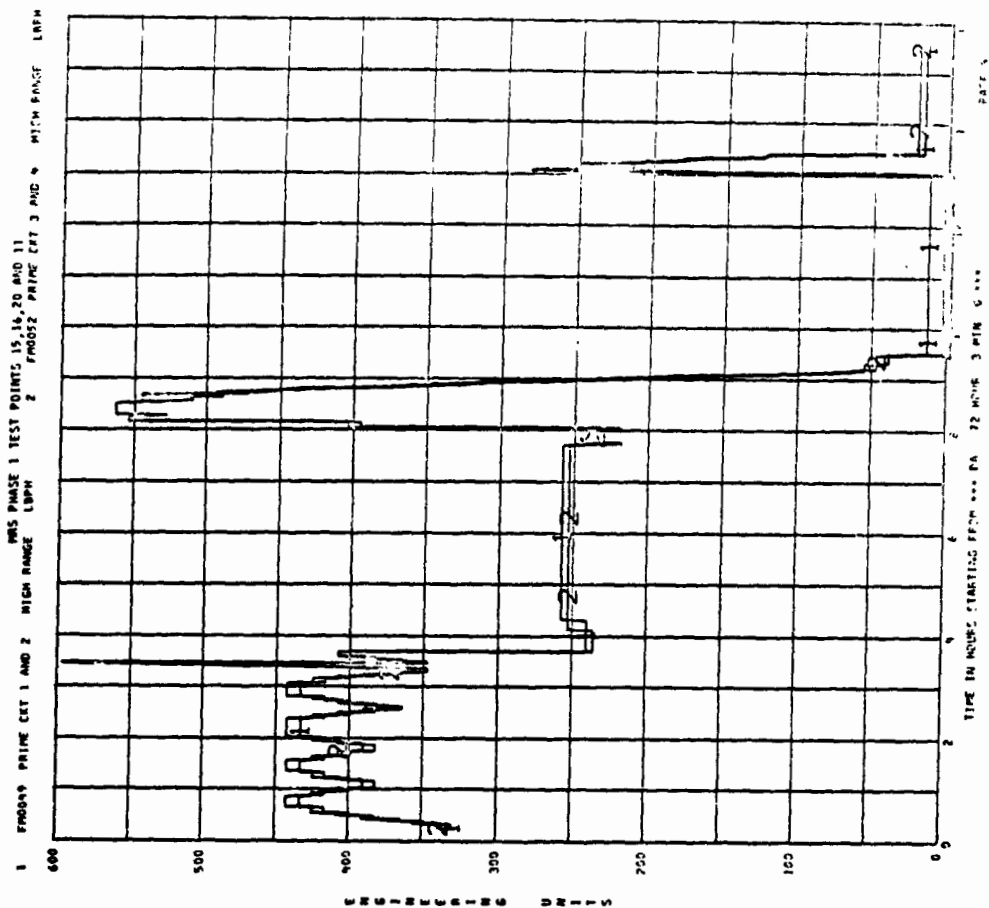
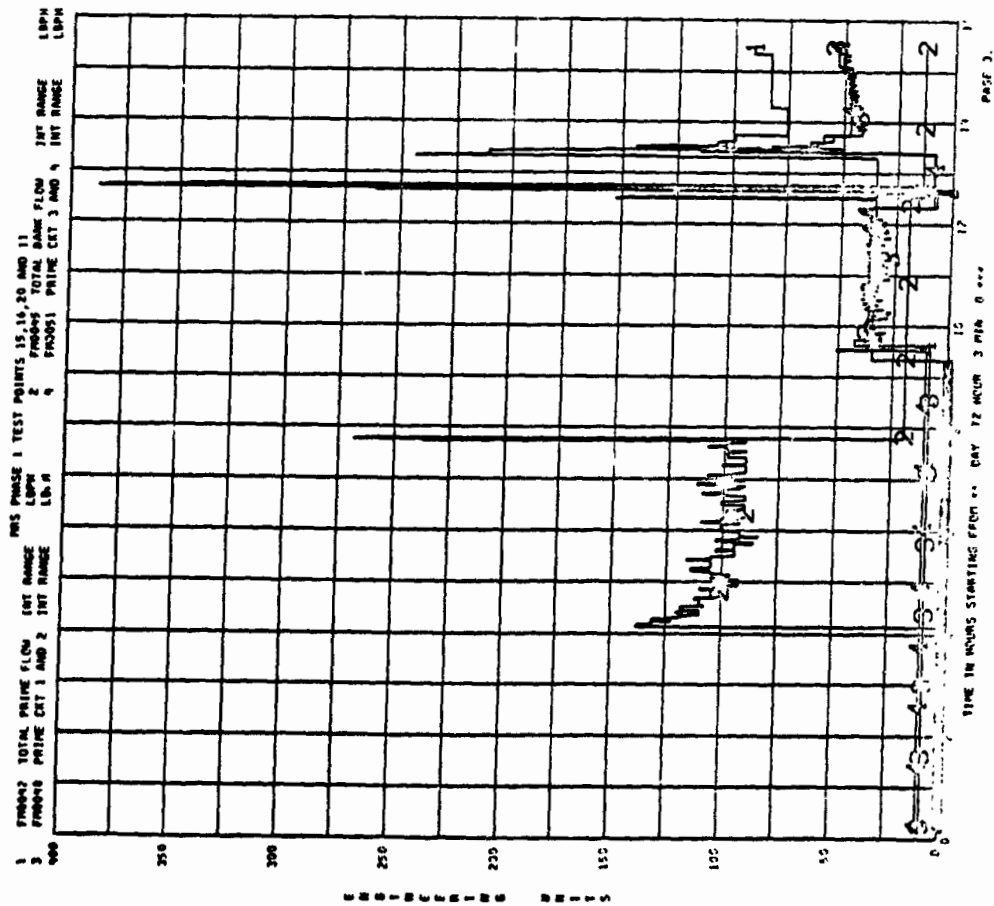


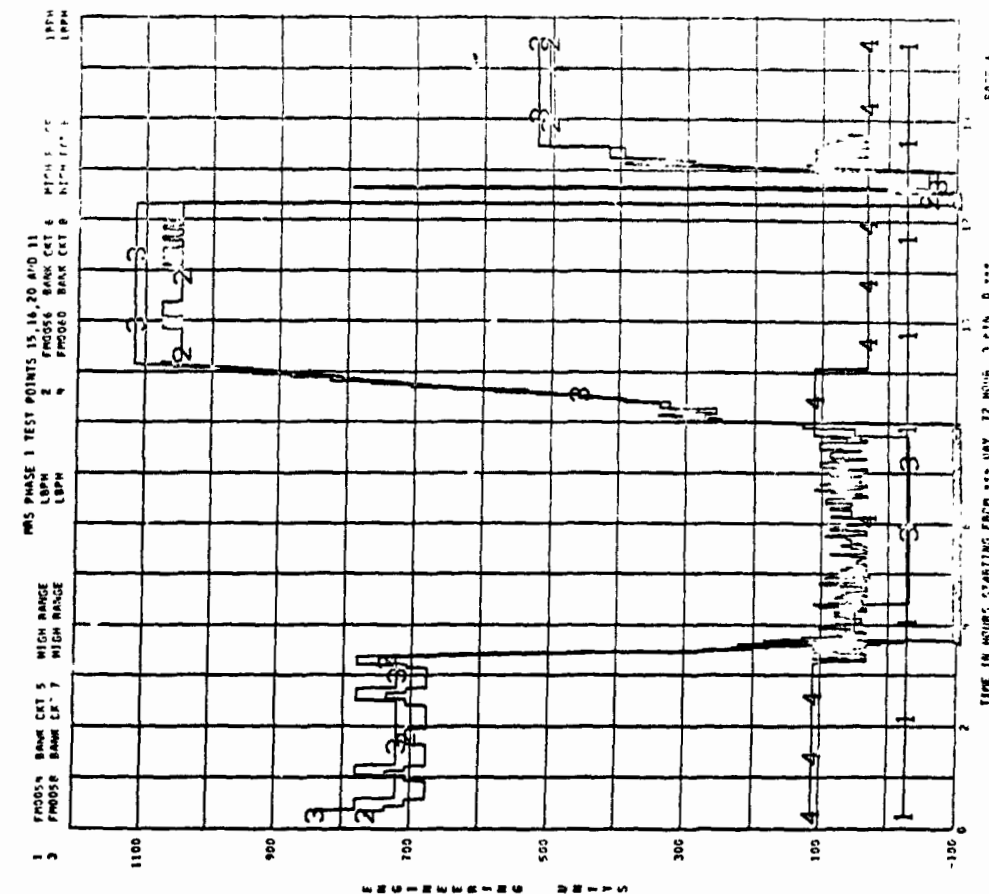
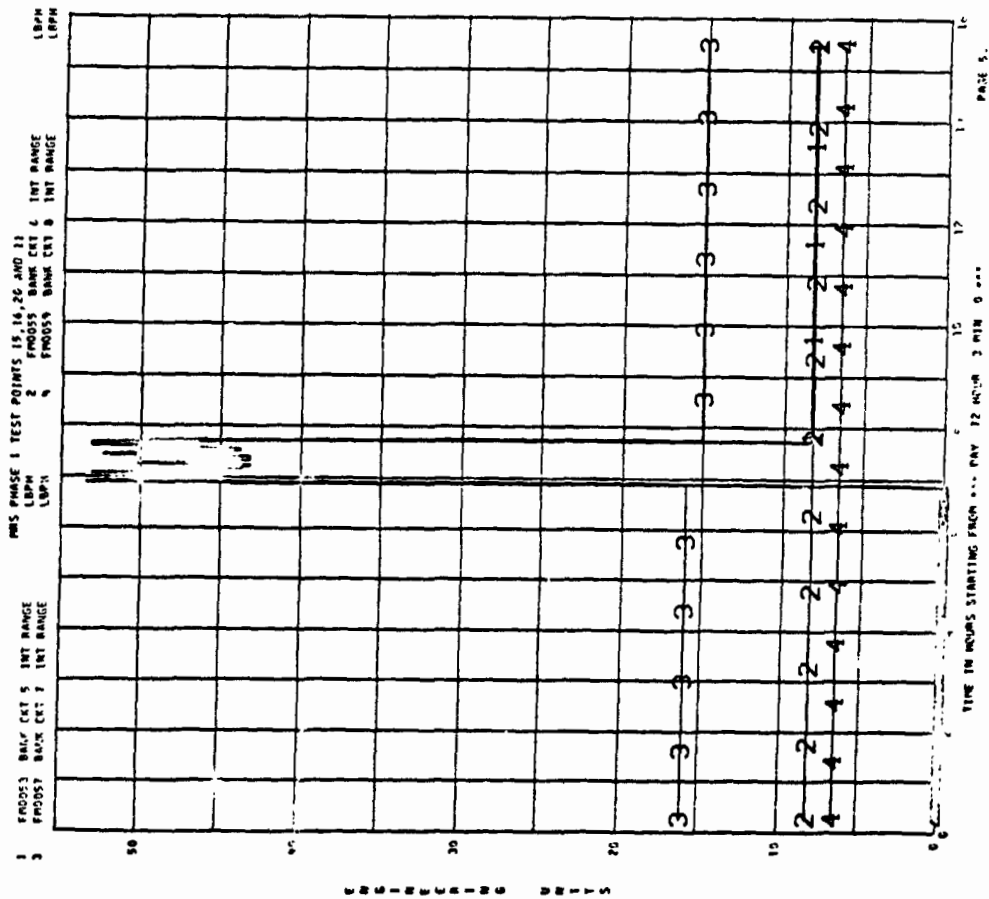
TEST GROUP E

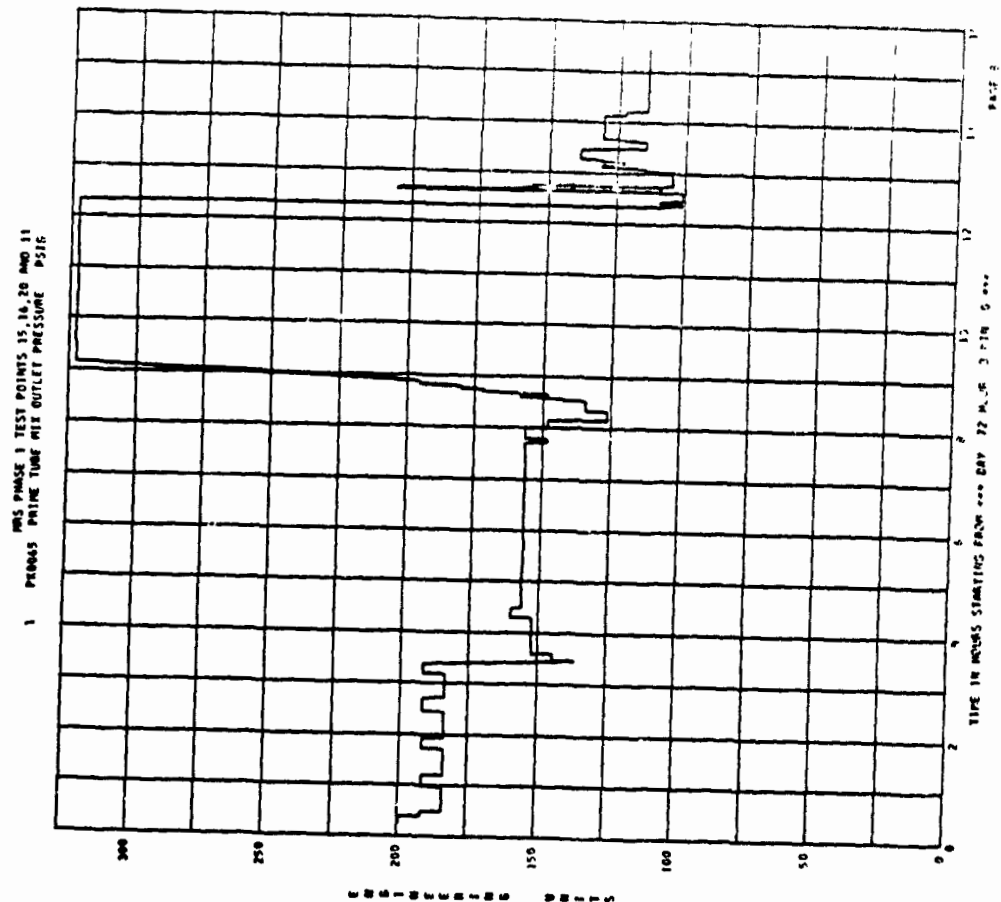
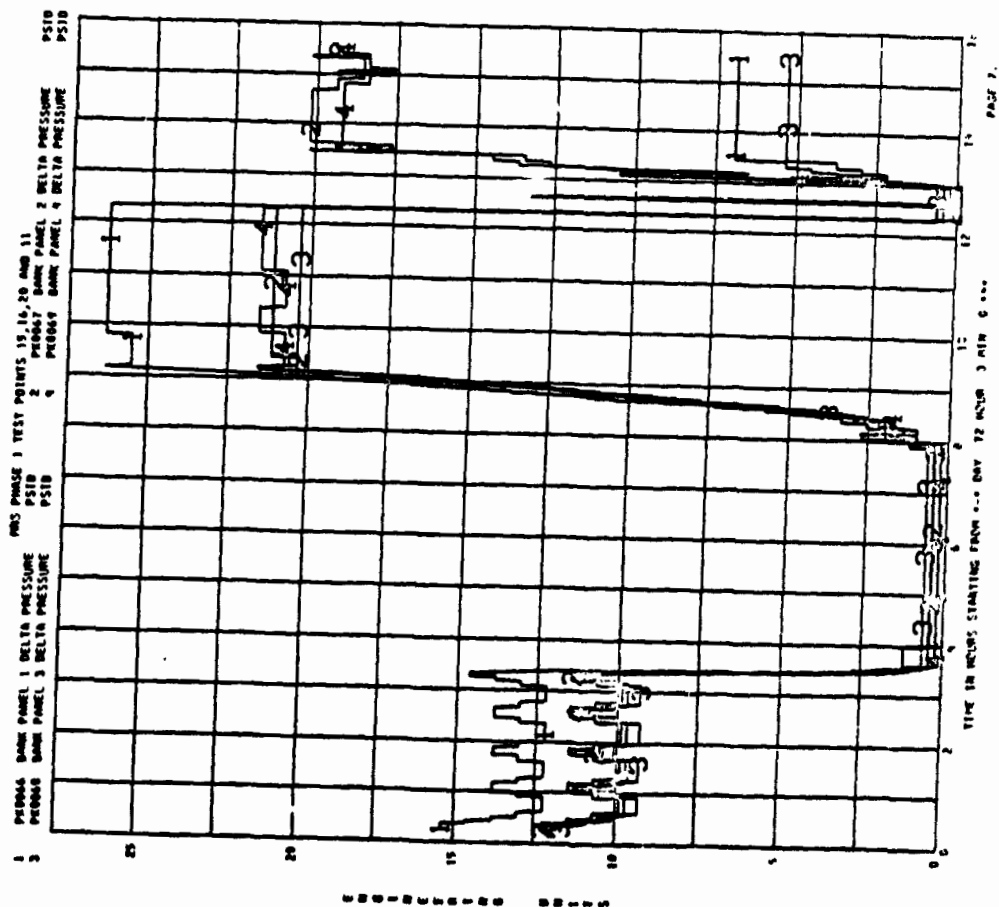
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INCLUDES TEST POINTS

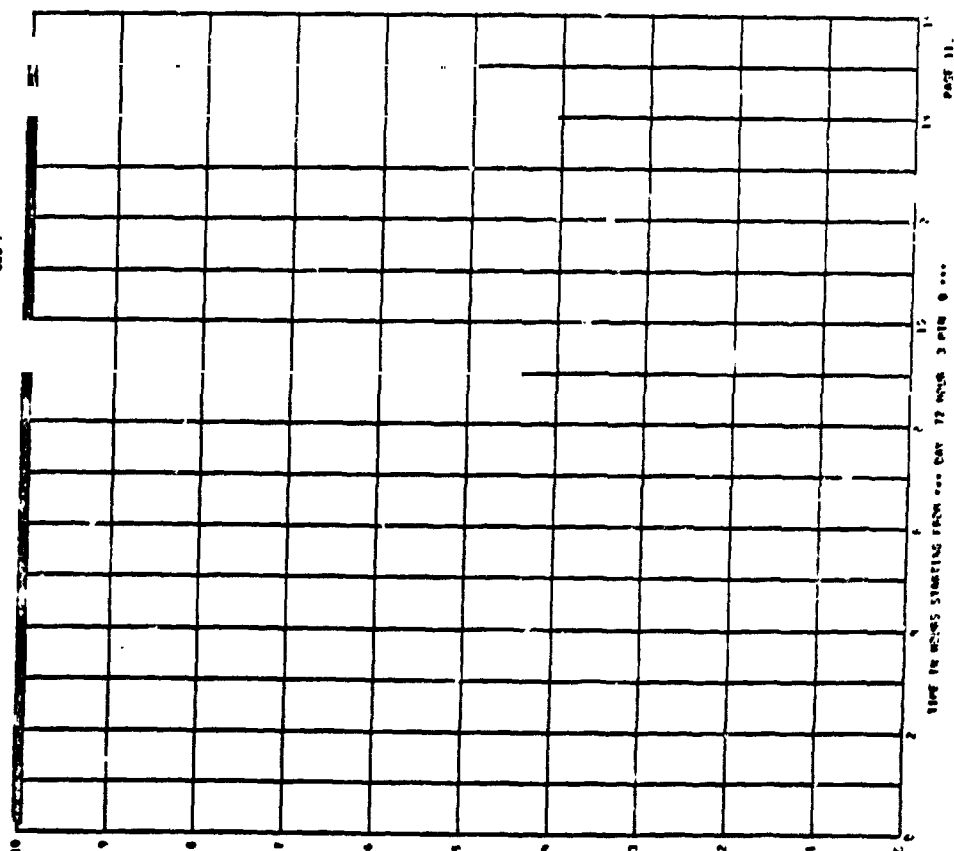
15(14A)
16
20
11



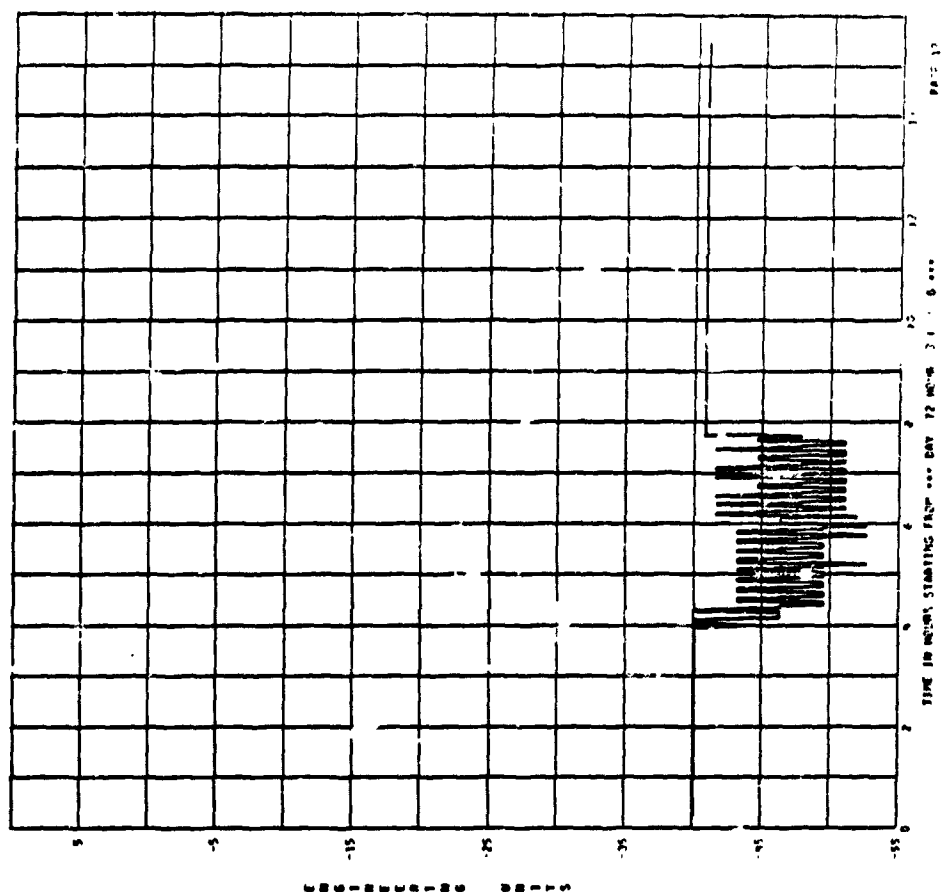




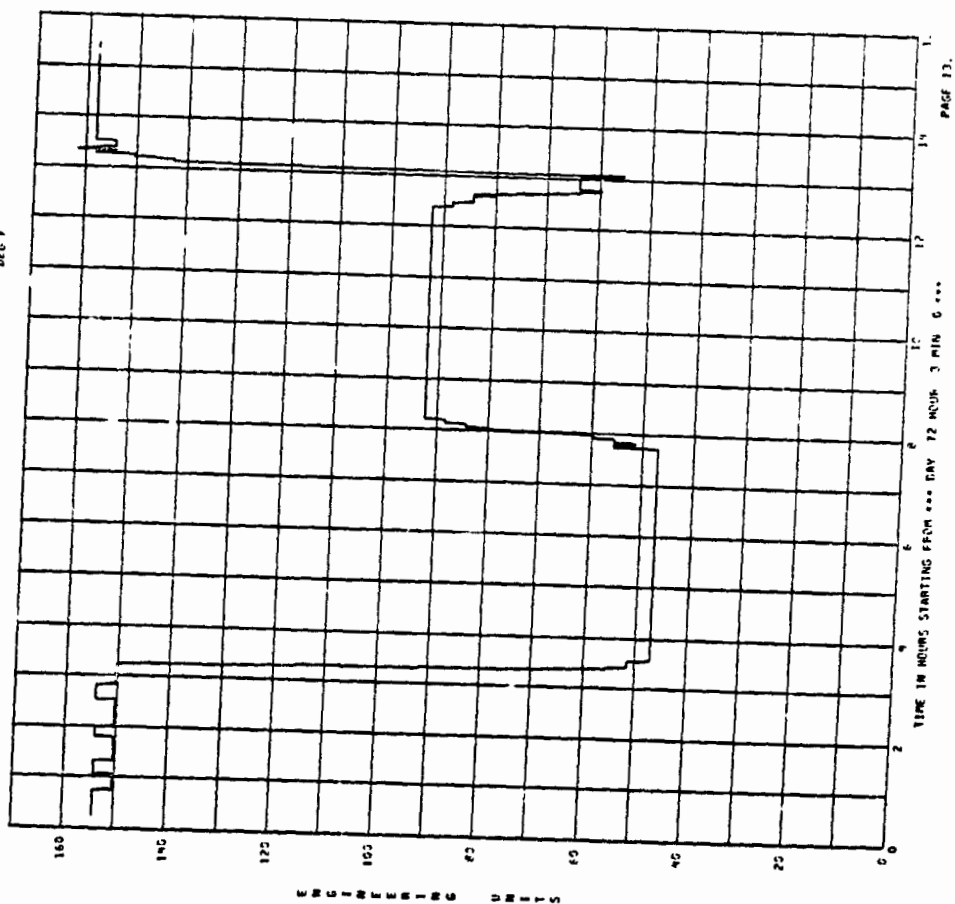
1 100001 PRIME SYSTEM INLET
MES PAGE 1 TEST POINTS 19,16,20 AND 11
MES F



PHASE 1 TEST POINTS 15, 16, 20 AND 11
AT0002 BAHN SYSTEM INLET
DESF

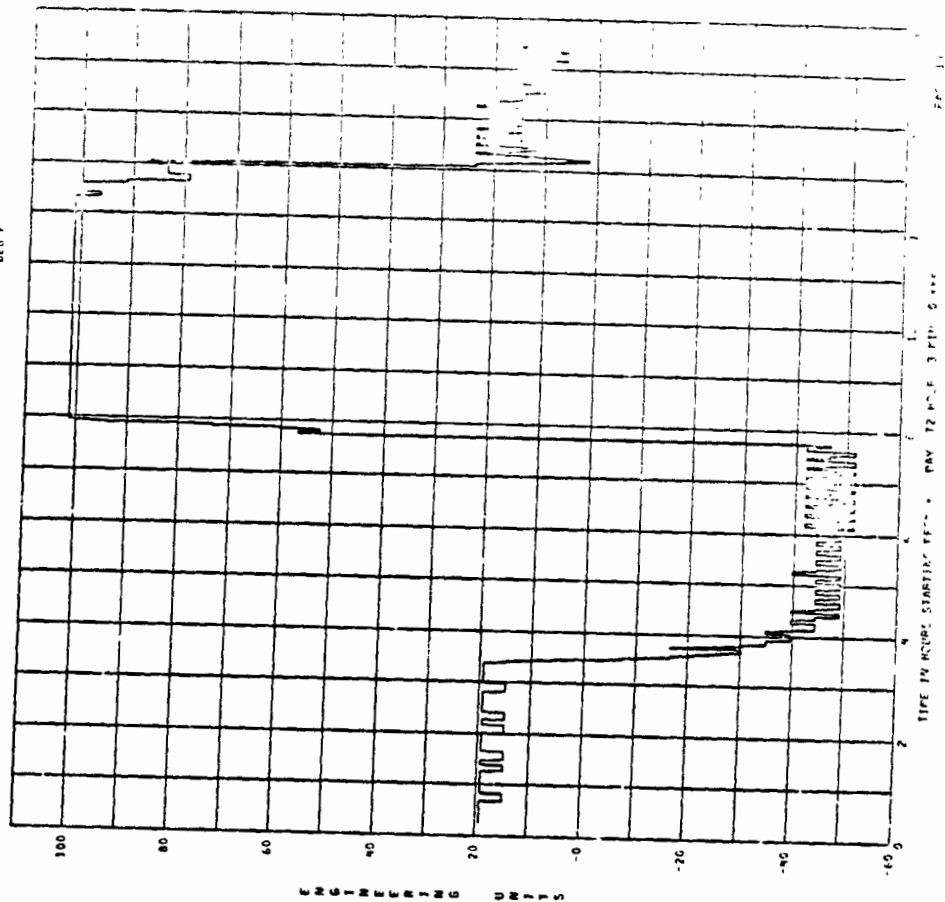


RMS PHASE 1 TEST POINTS 15, 16, 20 AND 21
 DEG F
 1 AJ0001 PRIME SYSTEM INLET



PAGE 13.

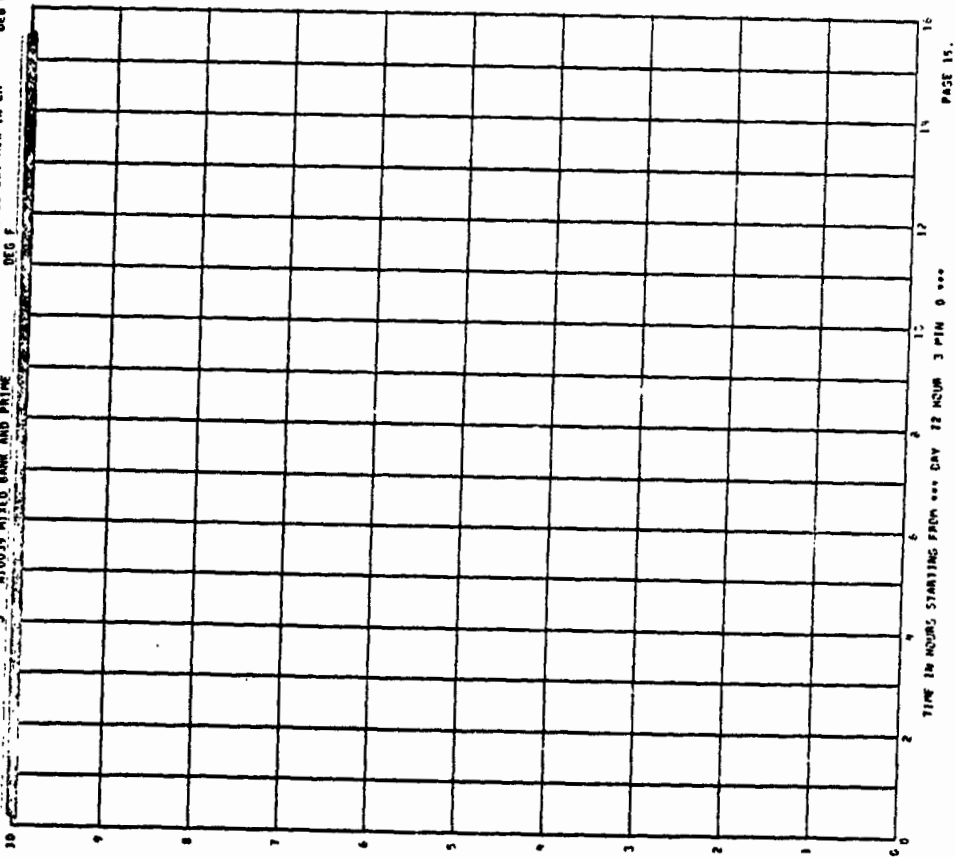
RMS PHASE 1 TEST POINTS 15, 16, 20 AND 21
 DEG F
 1 AJ0002 BANK SYSTEM INLET



TIME IN HOURS STARTING FROM DAY 72 HOUR 3 MIN 0 SEC

1 A10019 PRIME TUBES OUTLET MIX IN CH
 2 A10034 BANK TUBES OUTLET MIX IN CH
 3 A10039 MIXED BANK AND PRIME

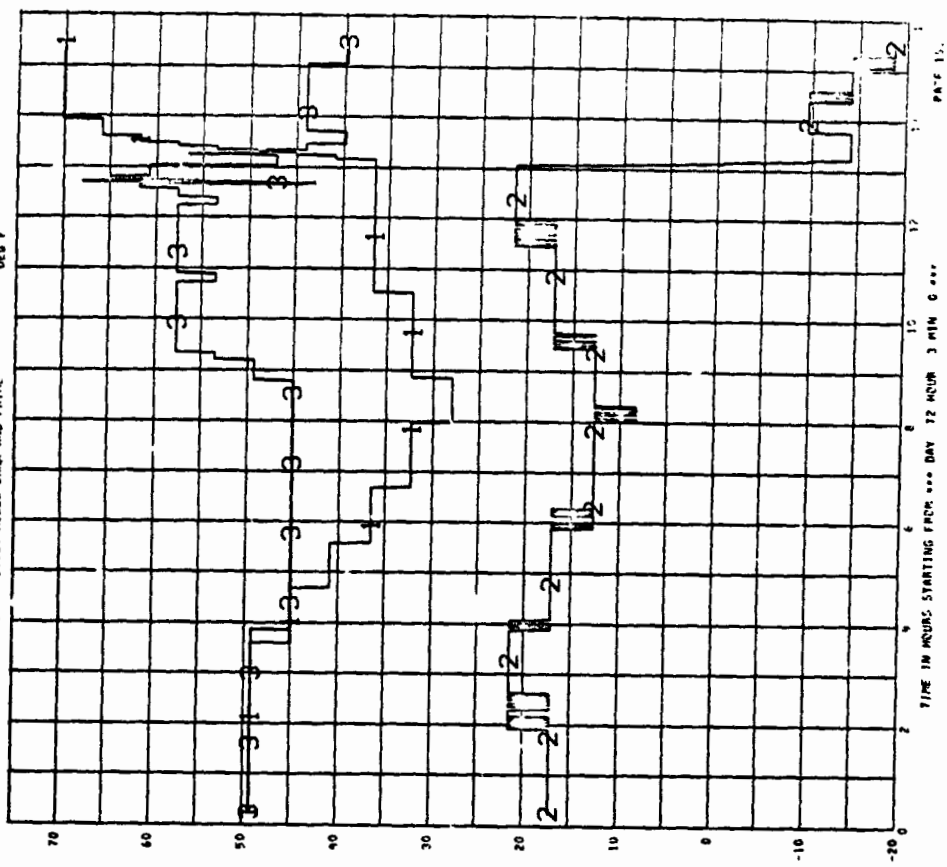
WMS PHASE 1 TEST POINTS 15, 16, 20 AND 11
 DEC F
 DEC F
 DEC F



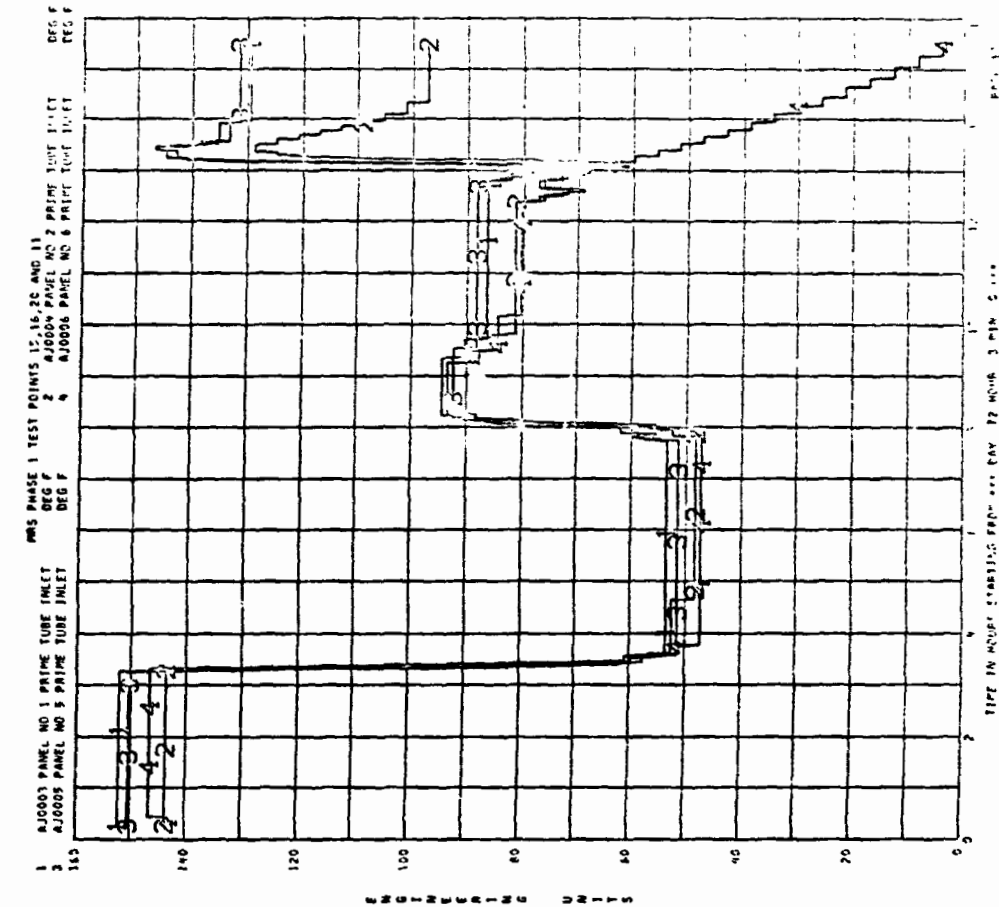
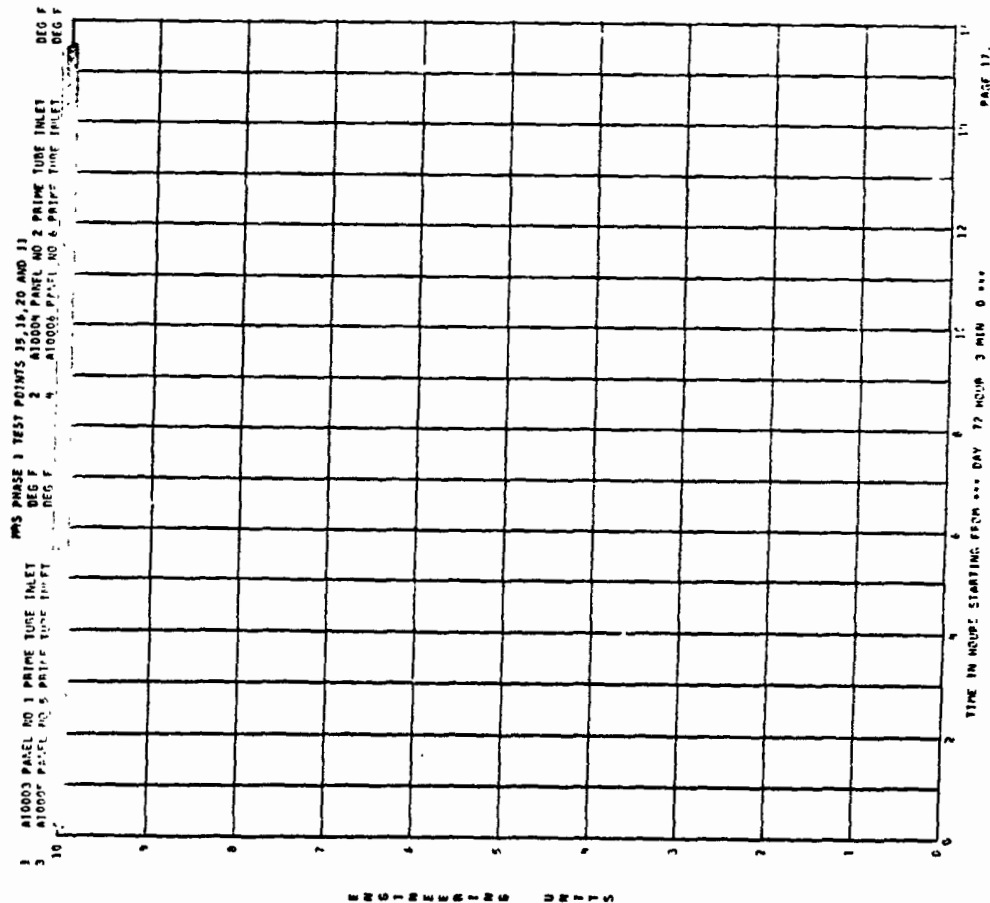
PAGE 15.

1 A10019 PRIME TUBES OUTLET MIX IN CH
 2 A10034 BANK TUBES OUTLET MIX IN CH
 3 A10039 MIXED BANK AND PRIME

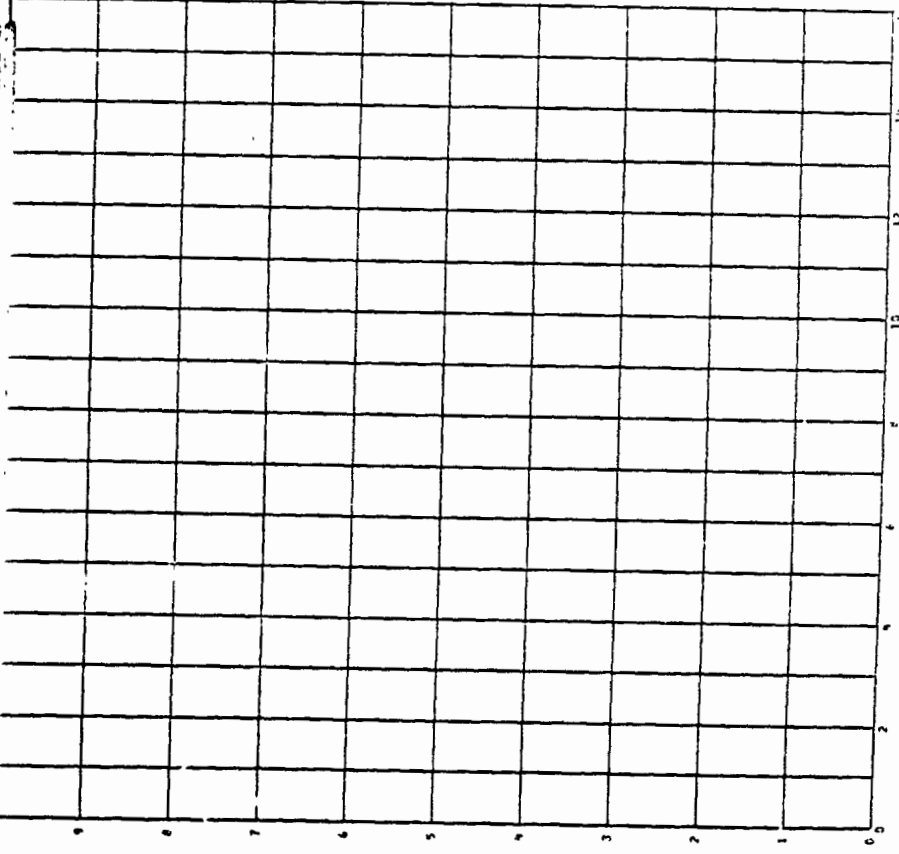
WMS PHASE 1 TEST POINTS 15, 16, 20 AND 11
 DEC F
 DEC F
 DEC F



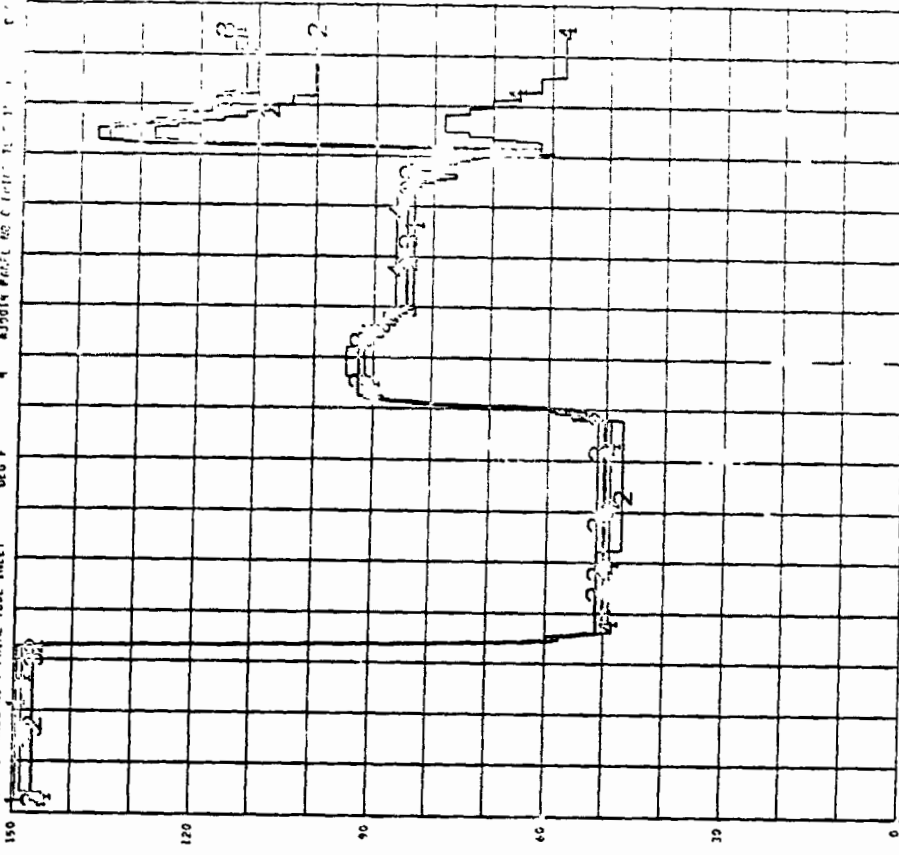
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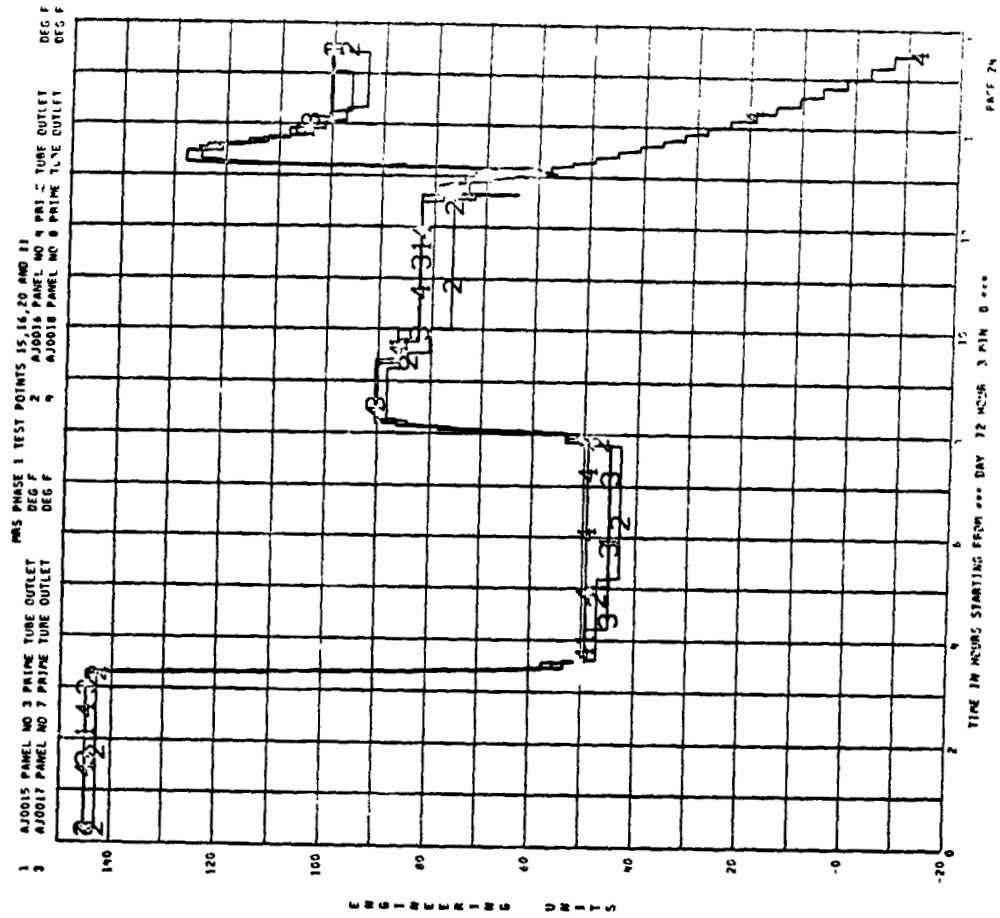
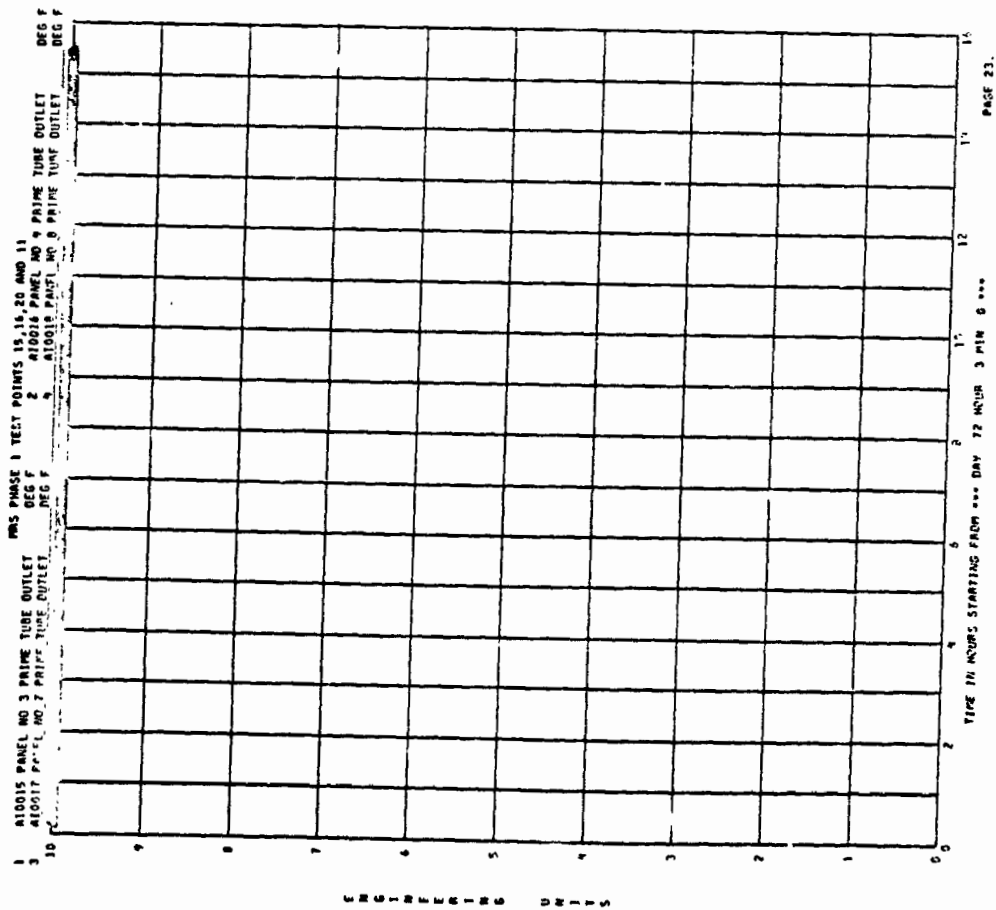


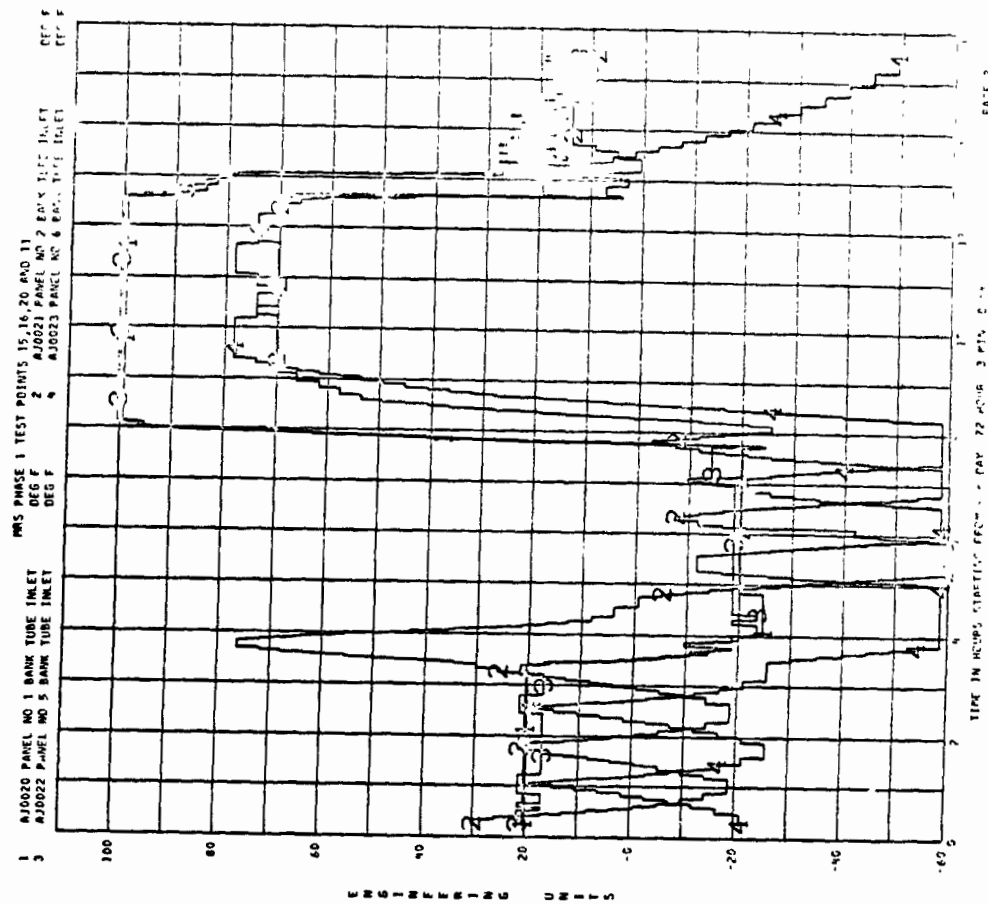
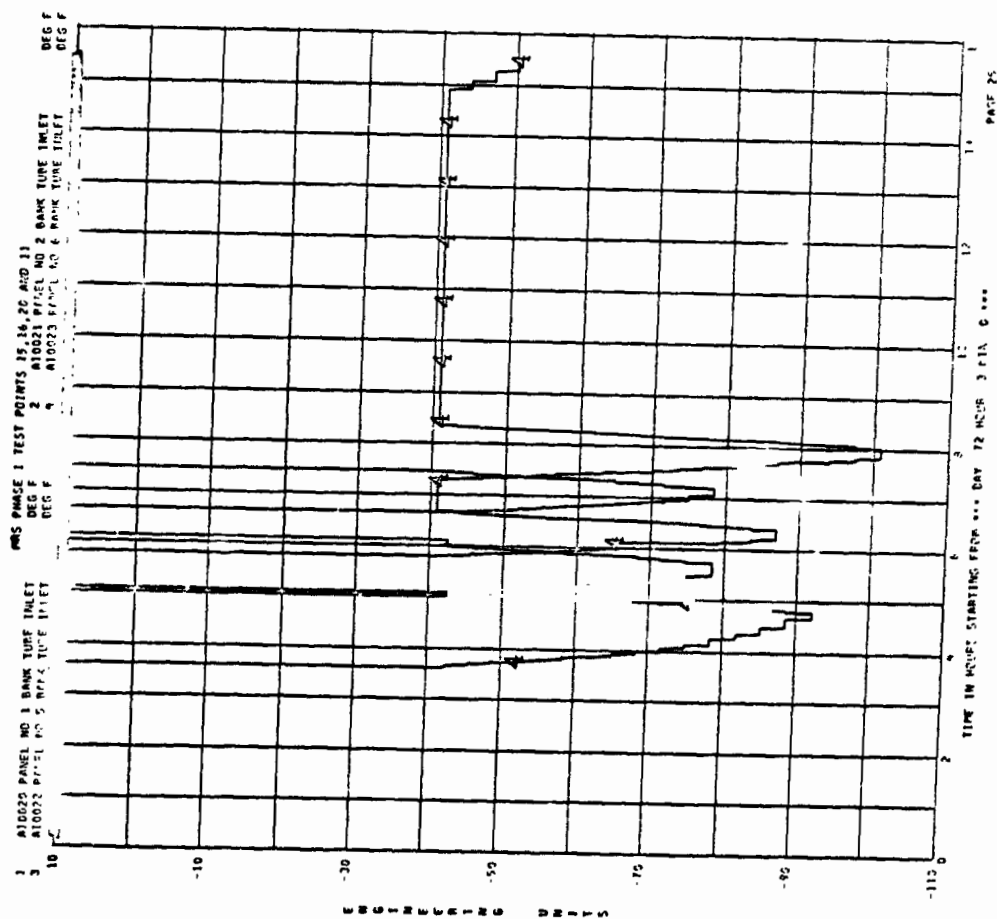
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 2 A10012 PANEL NO 4 PRIME TUBE INLET DEG F
 3 A10013 PANEL NO 5 PRIME TUBE INLET DEG F
 4 A10014 PANEL NO 6 PRIME TUBE INLET DEG F
 5 A10015 PANEL NO 7 PRIME TUBE INLET DEG F
 6 A10016 PANEL NO 8 PRIME TUBE INLET DEG F
 7 A10017 PANEL NO 9 PRIME TUBE INLET DEG F
 8 A10018 PANEL NO 10 PRIME TUBE INLET DEG F
 9 A10019 PANEL NO 11 PRIME TUBE INLET DEG F
 10 A10020 PANEL NO 12 PRIME TUBE INLET DEG F

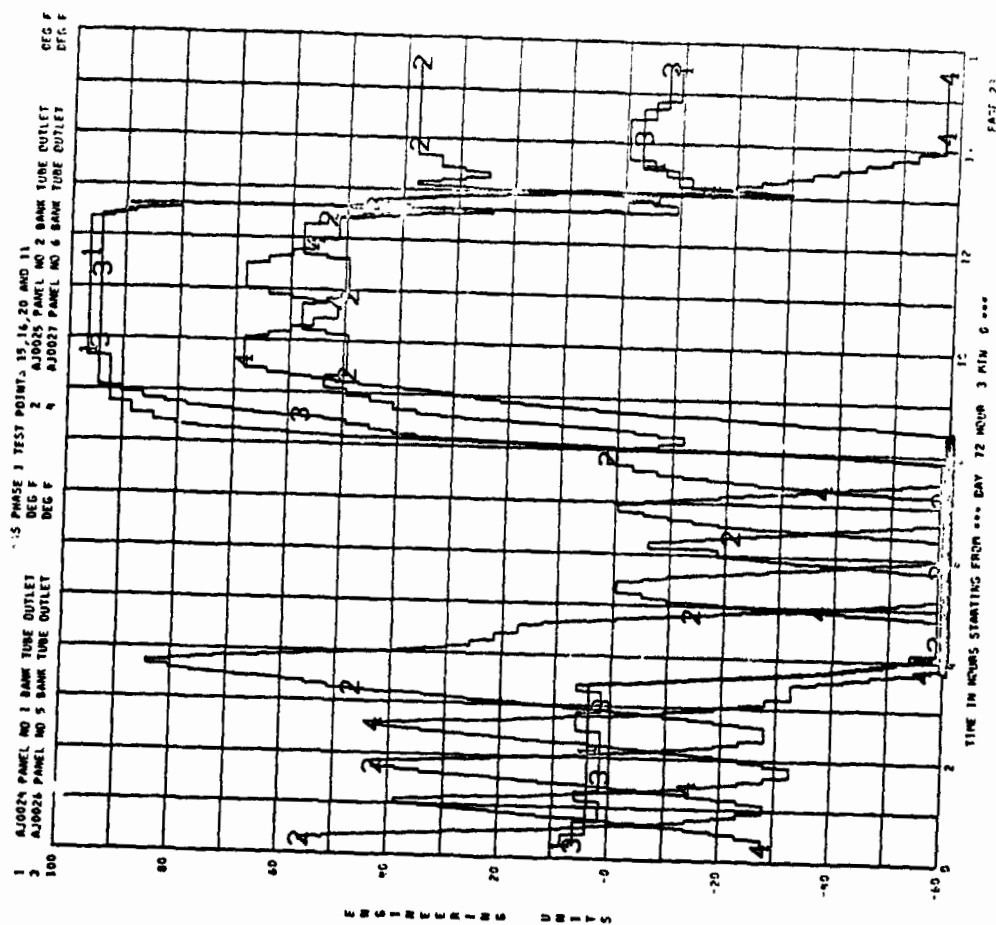
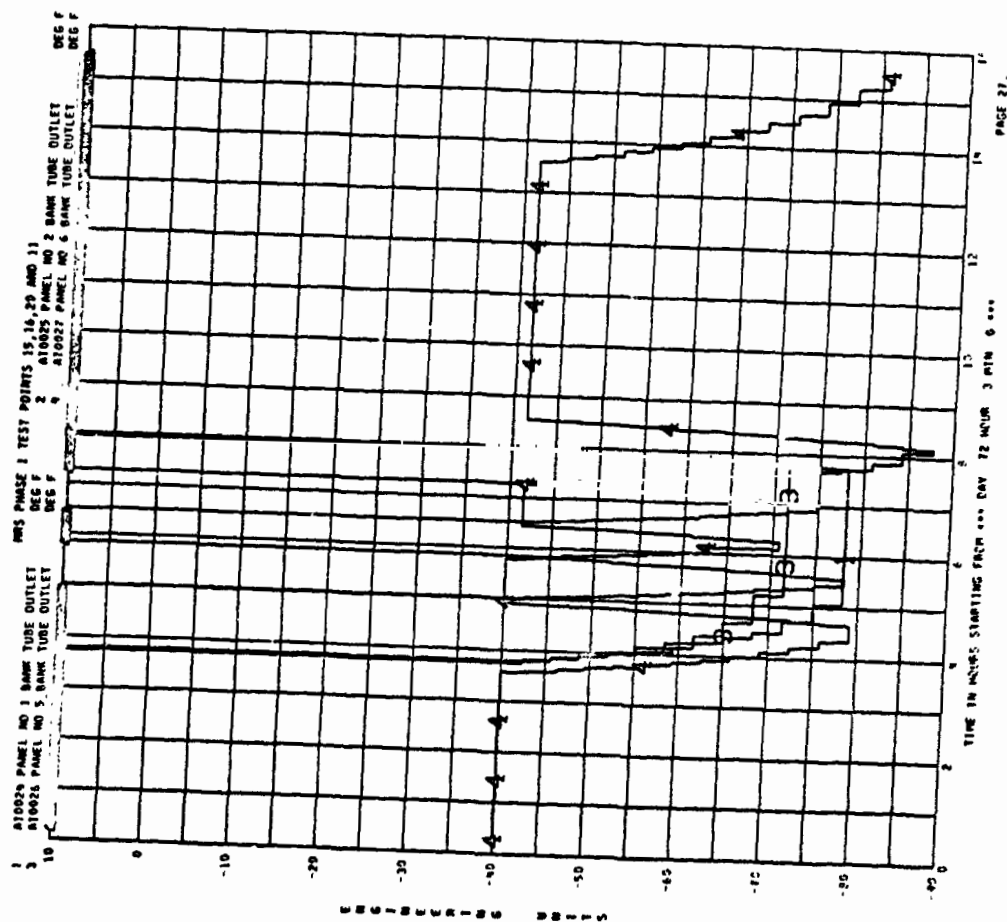


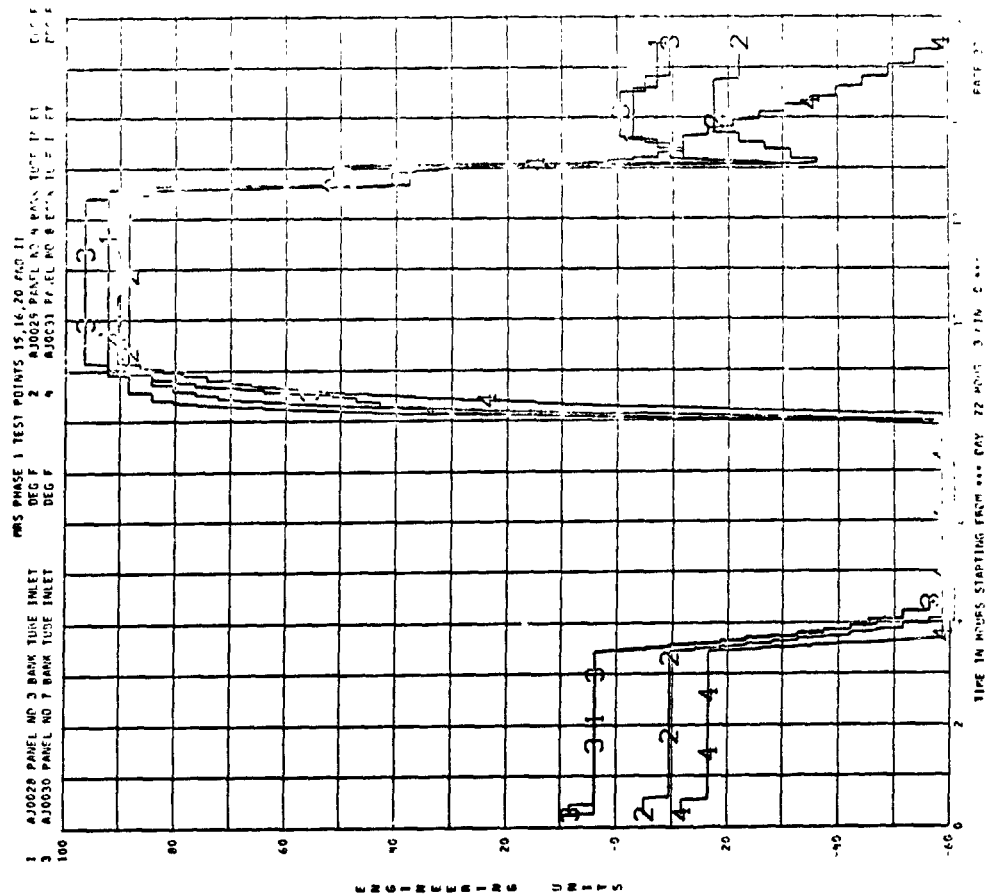
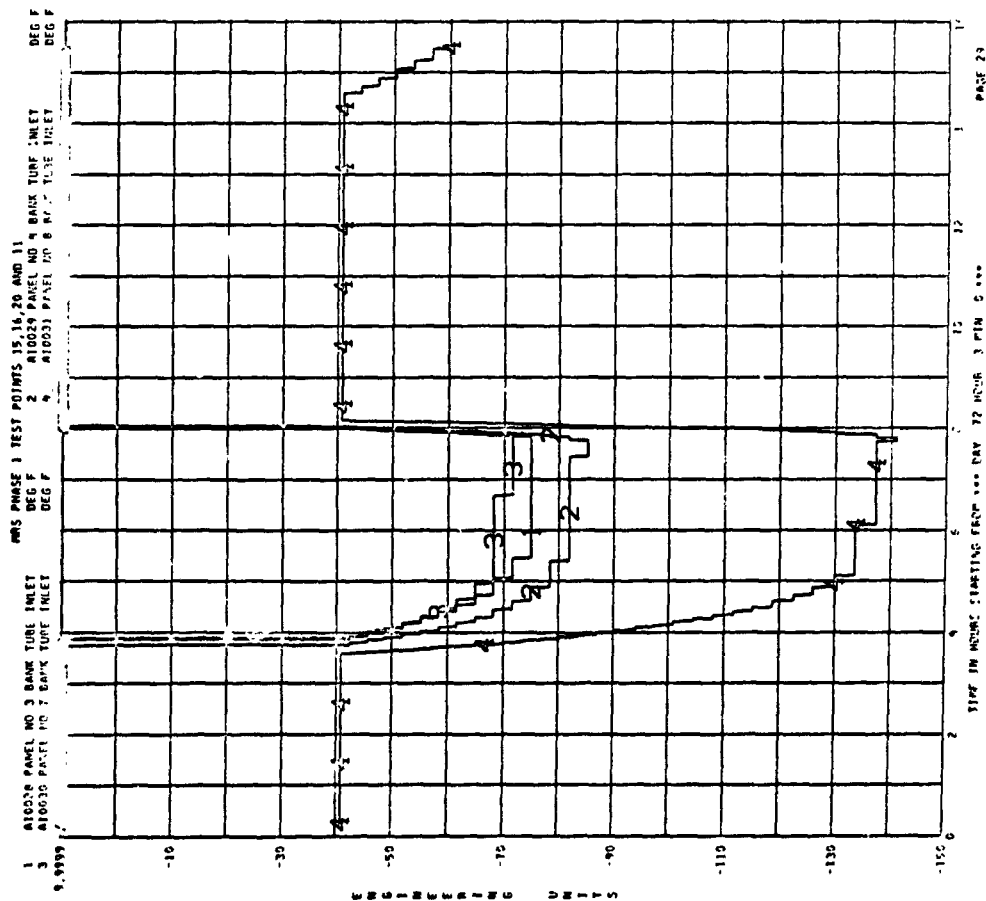
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 4 A10014 PANEL NO 6 PRIME TUBE INLET DEG F
 5 A10015 PANEL NO 7 PRIME TUBE INLET DEG F
 6 A10016 PANEL NO 8 PRIME TUBE INLET DEG F
 7 A10017 PANEL NO 9 PRIME TUBE INLET DEG F
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 10 A10020 PANEL NO 12 PRIME TUBE INLET DEG F

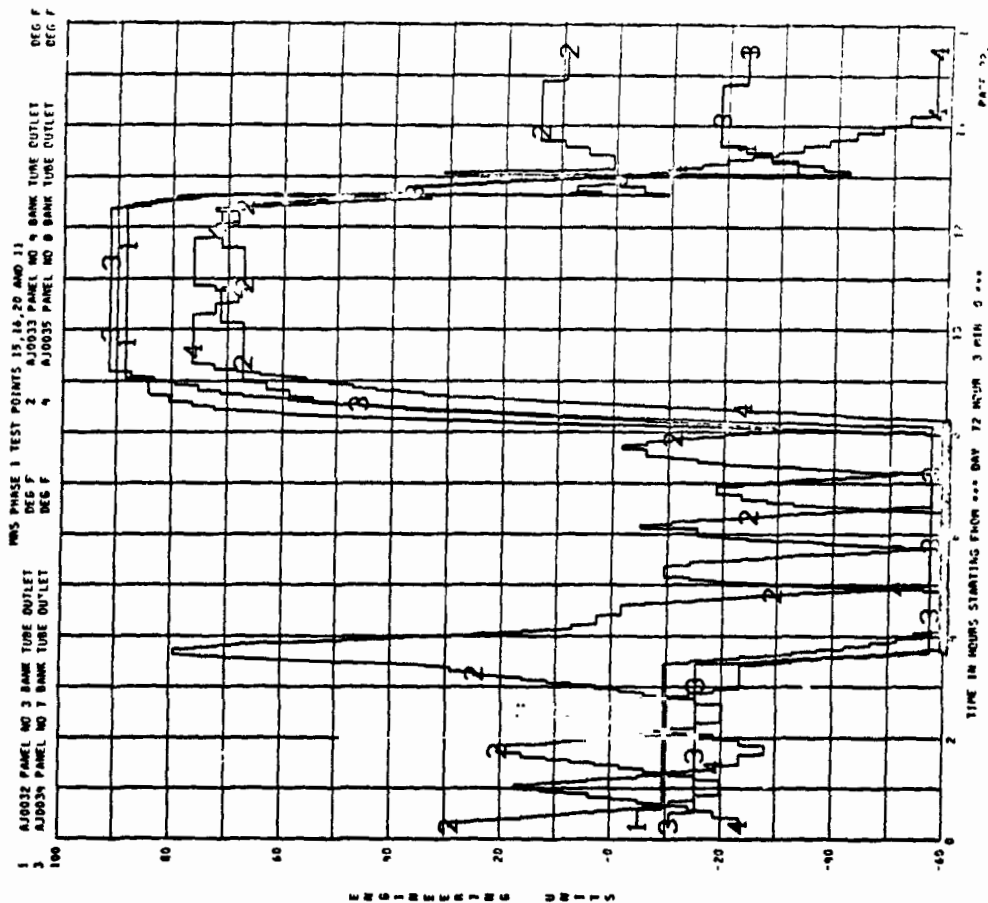
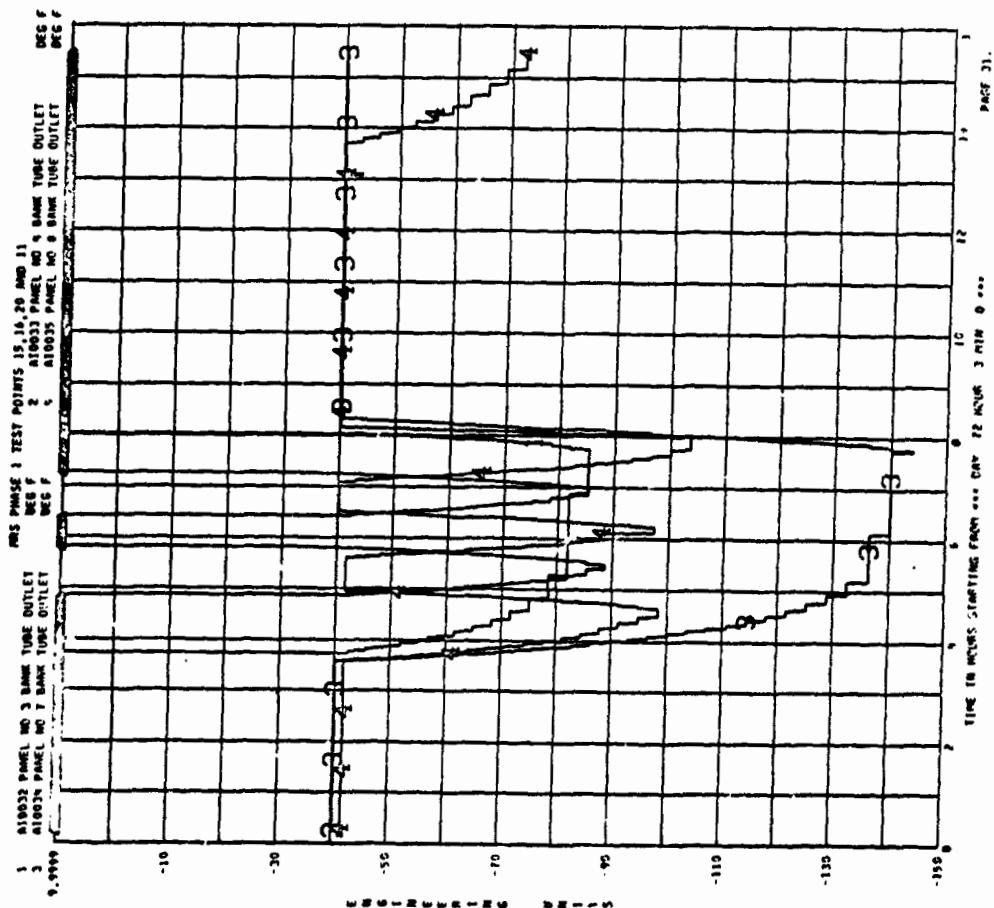


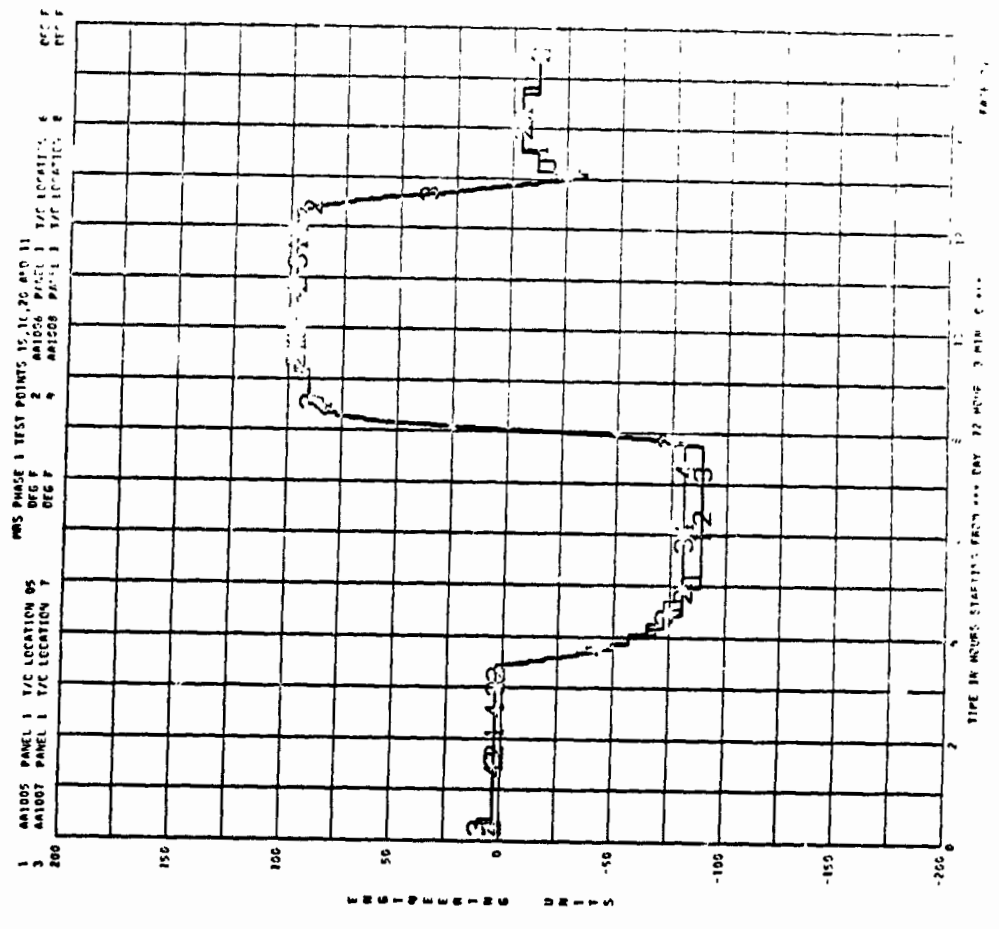
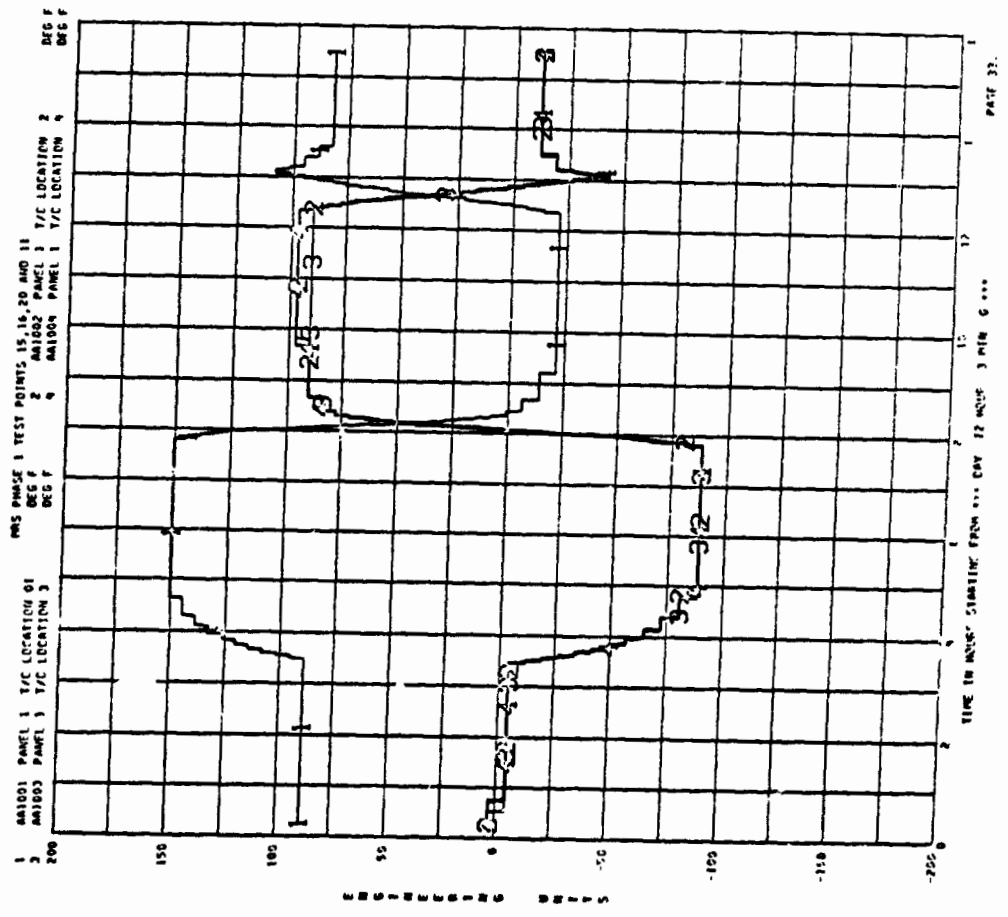


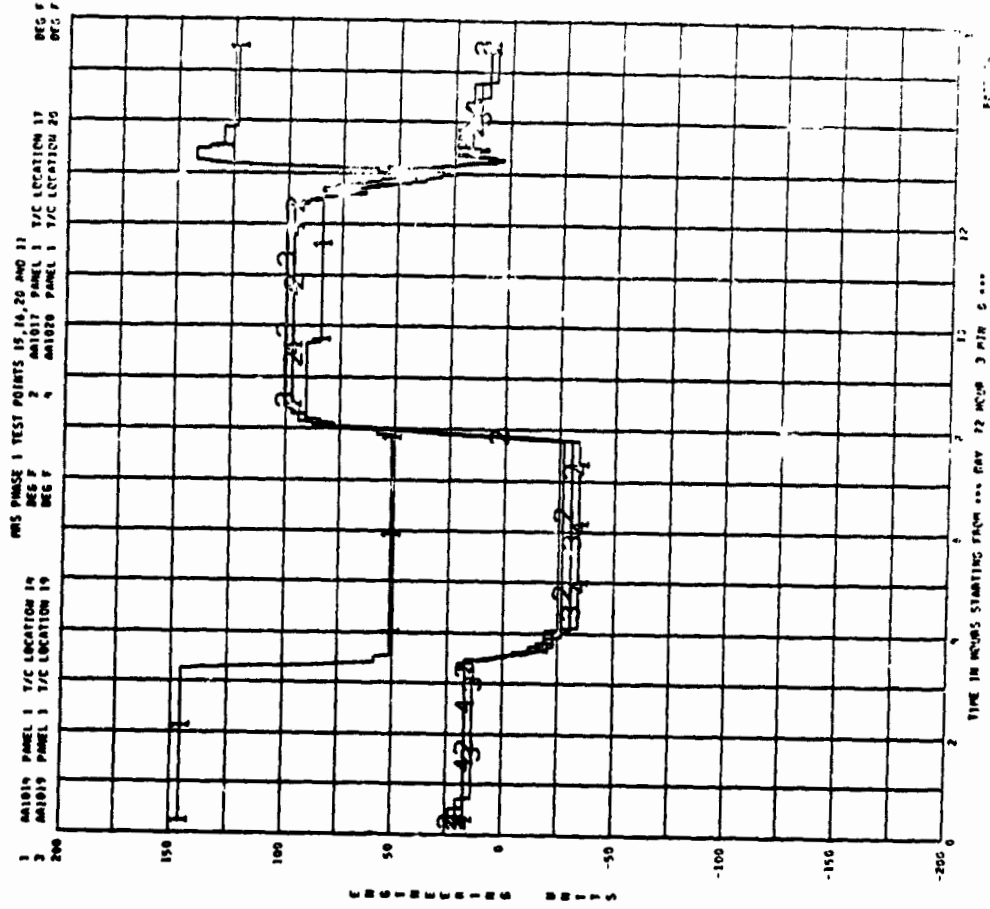
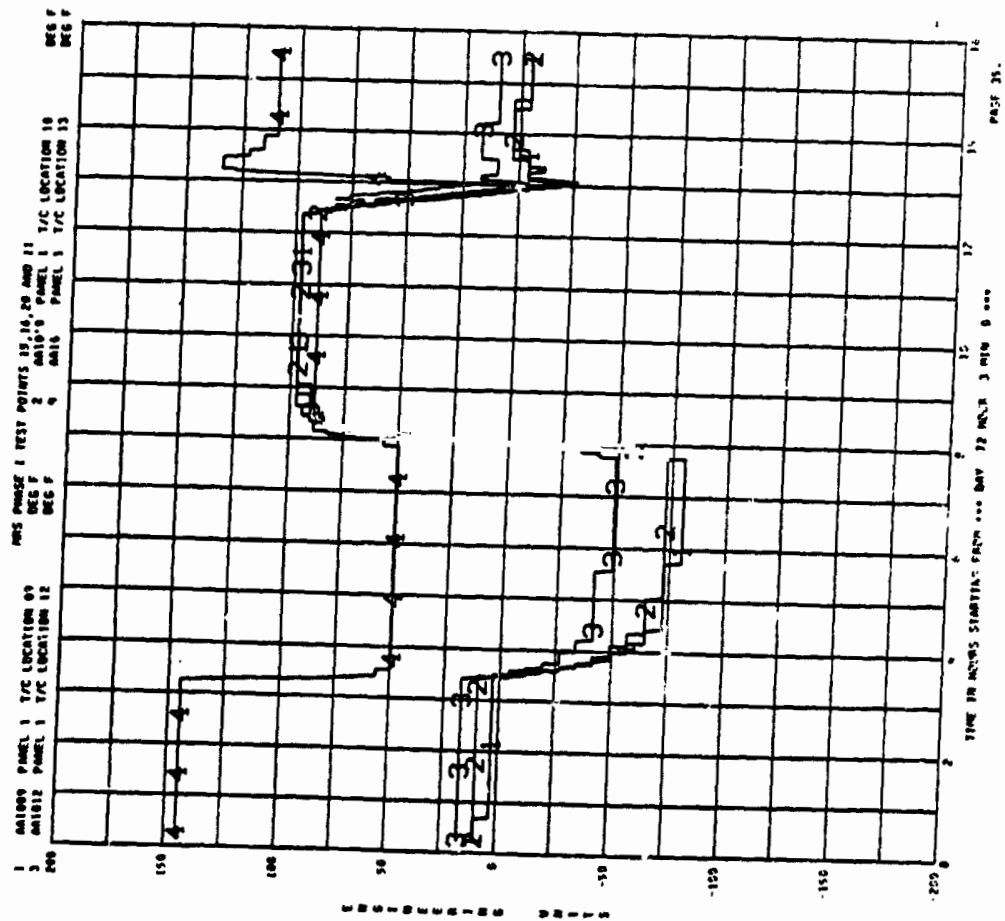


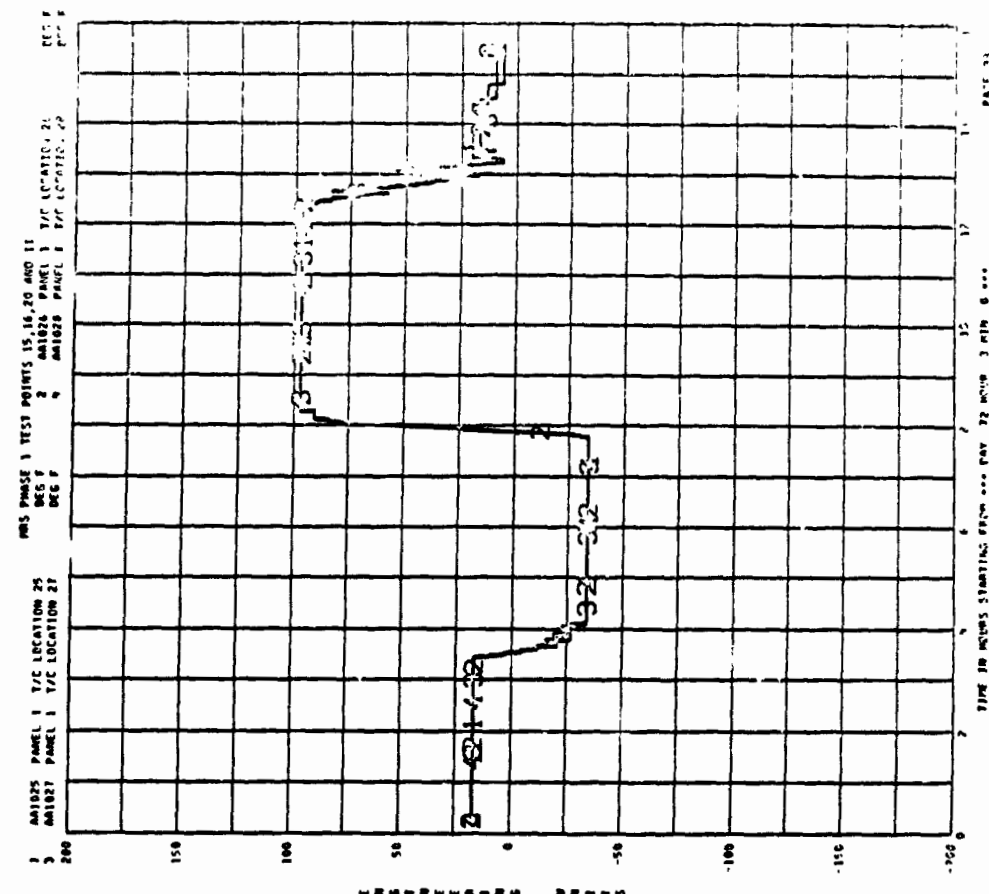
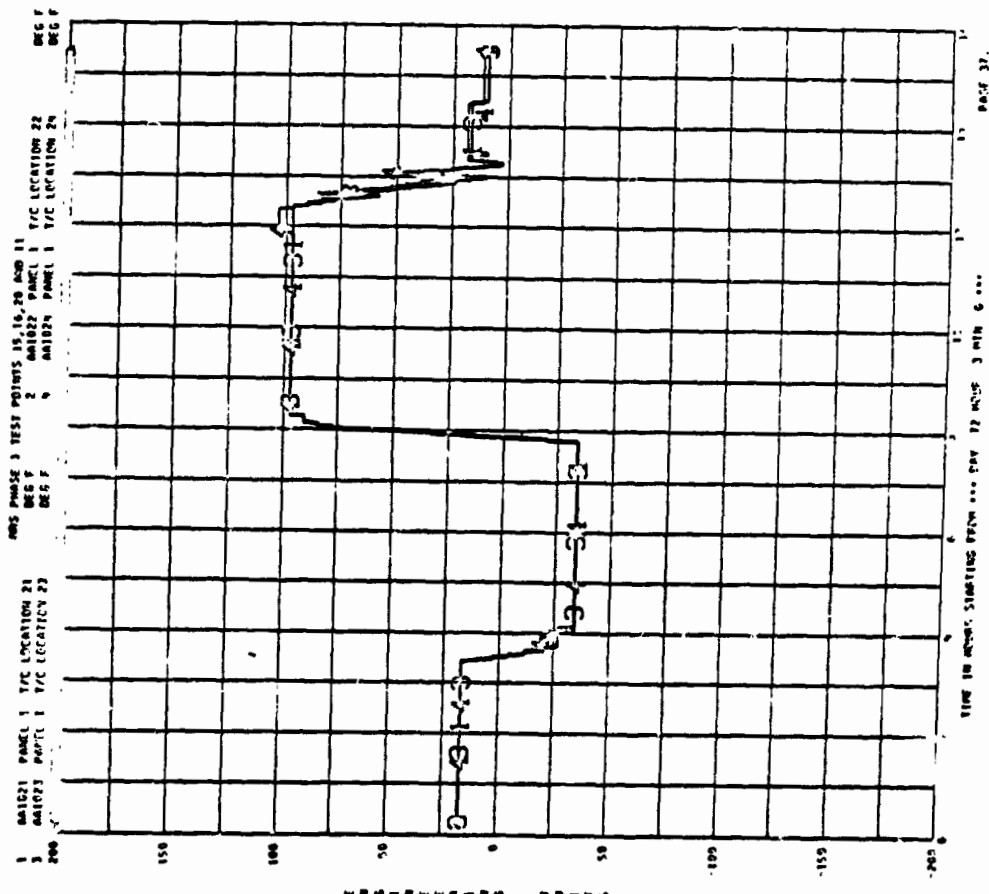


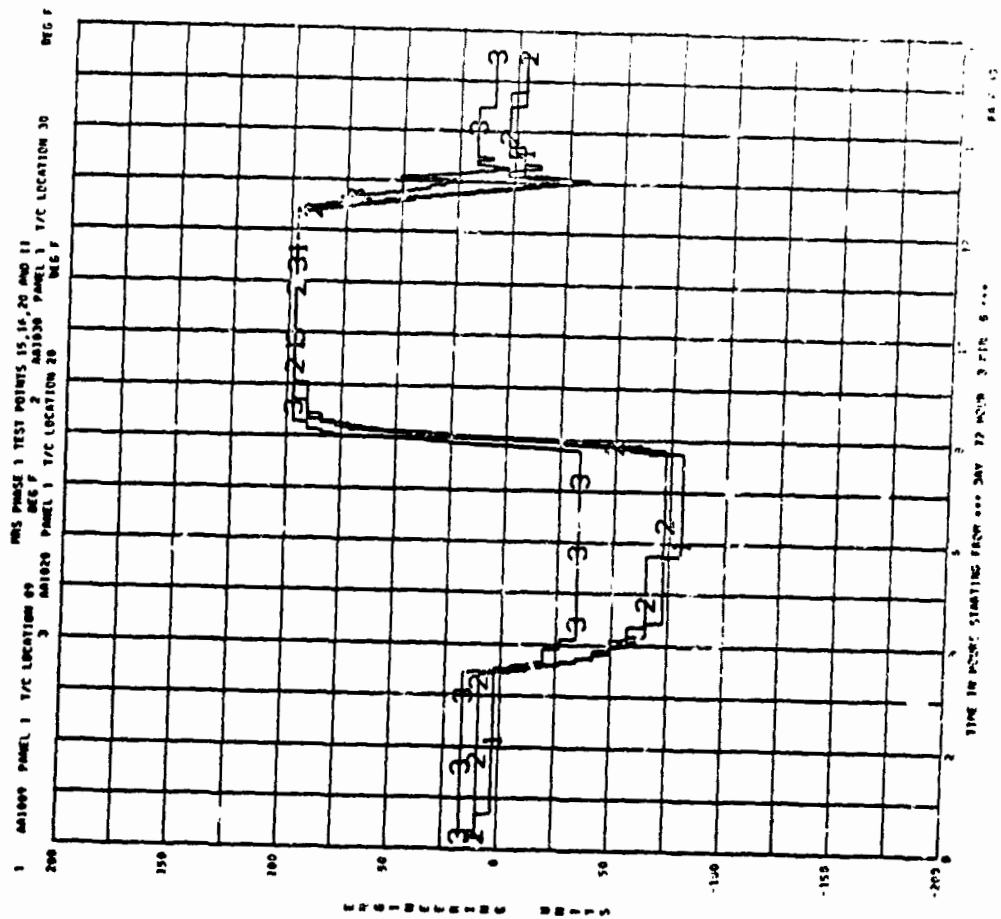
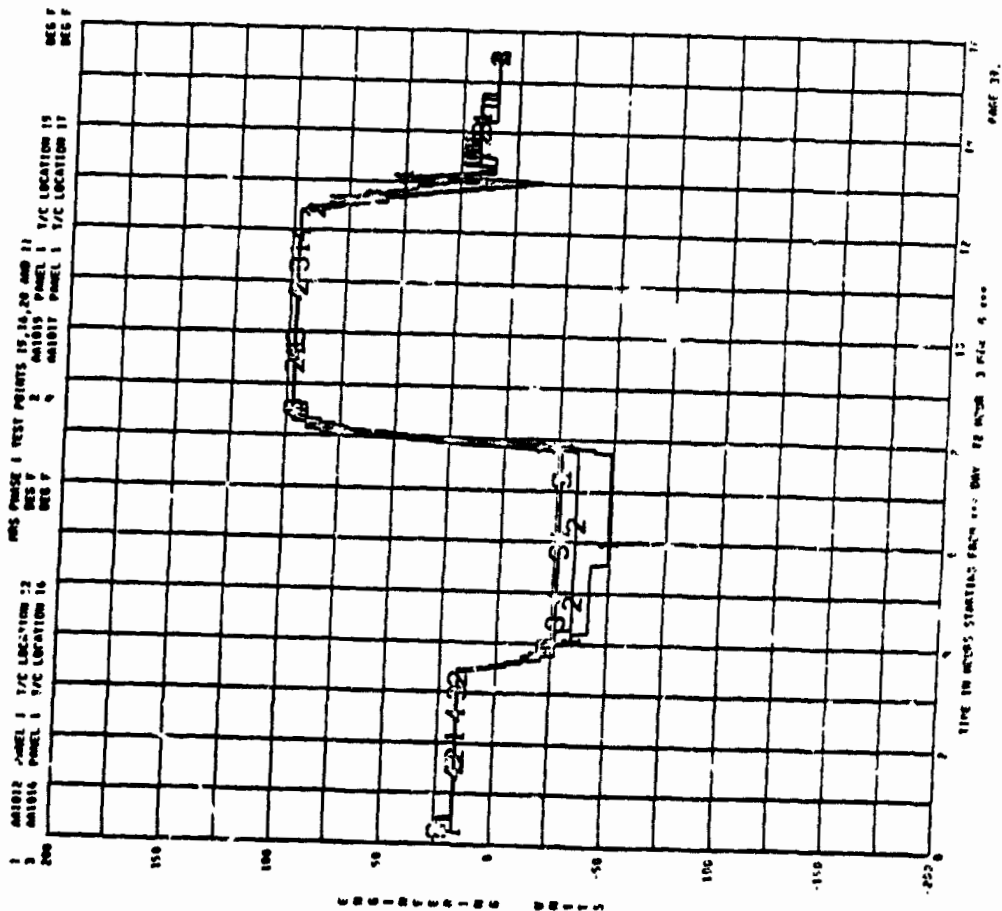


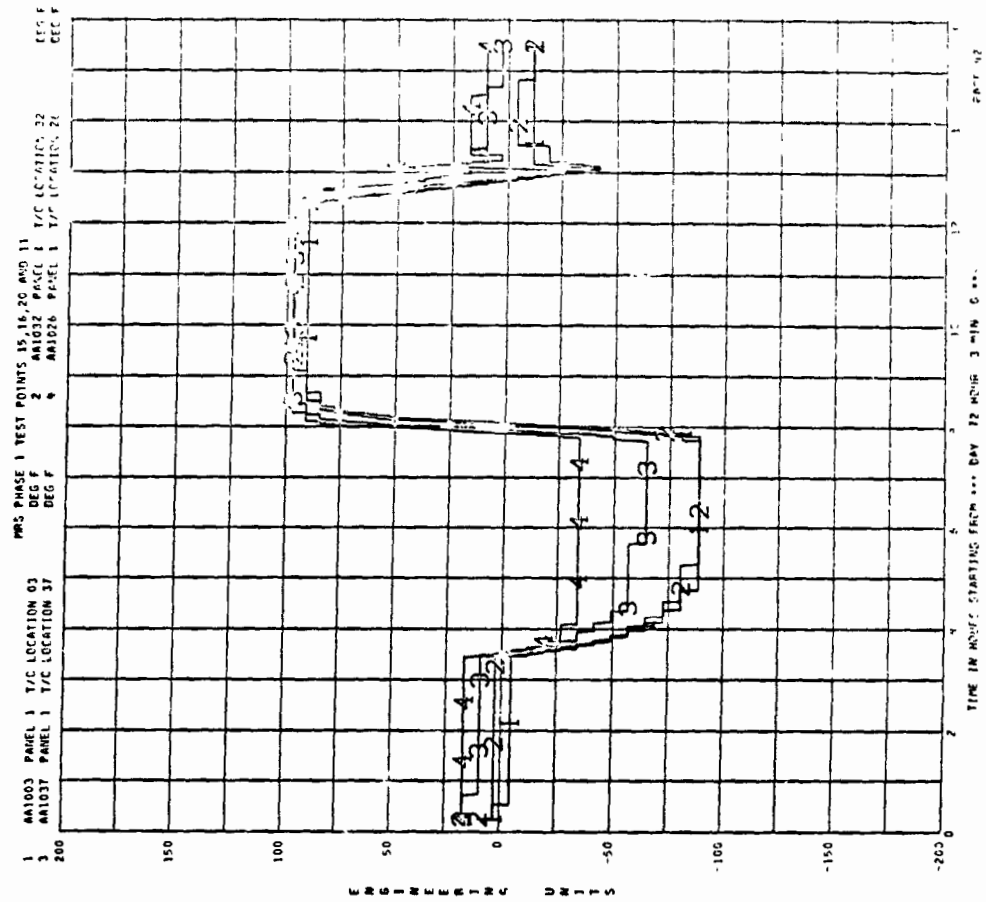
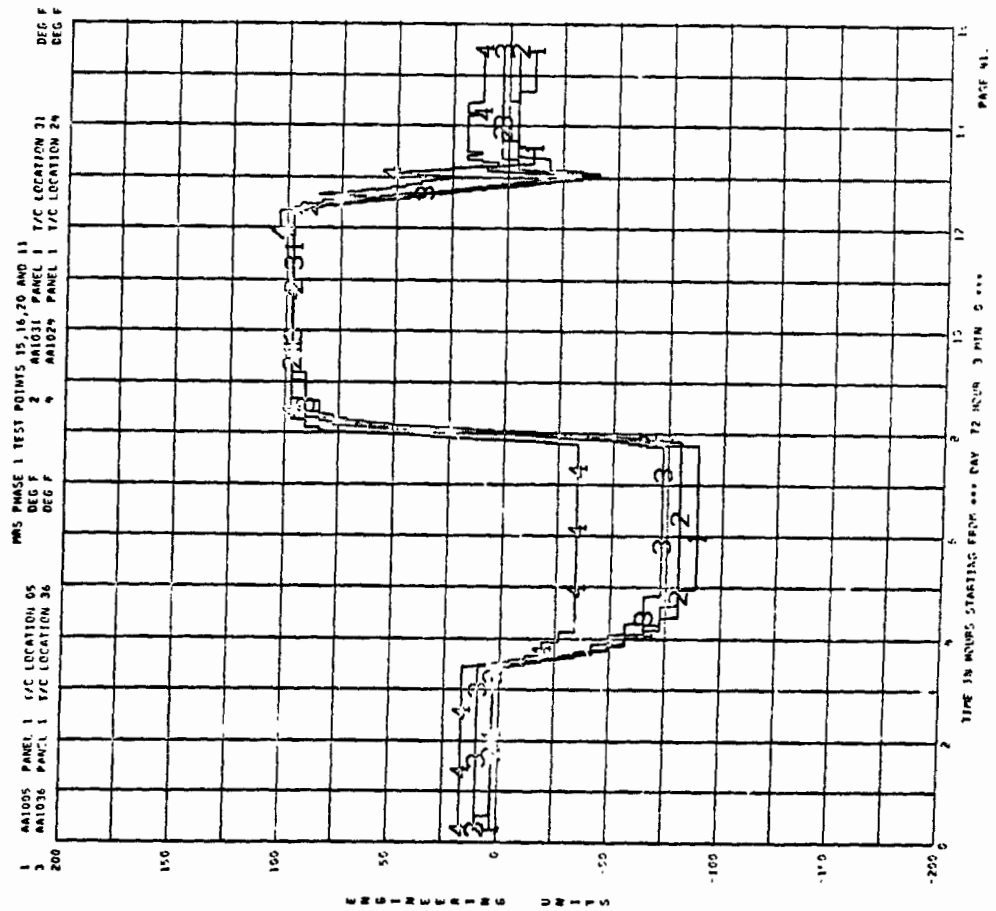


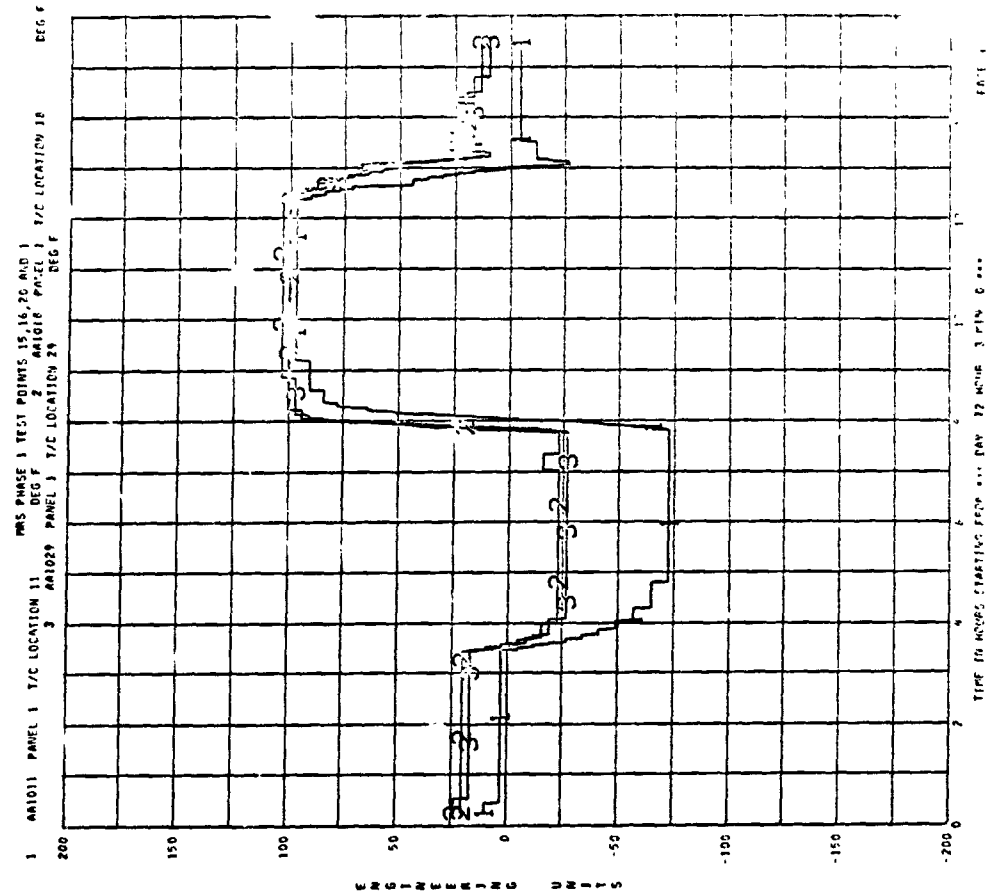
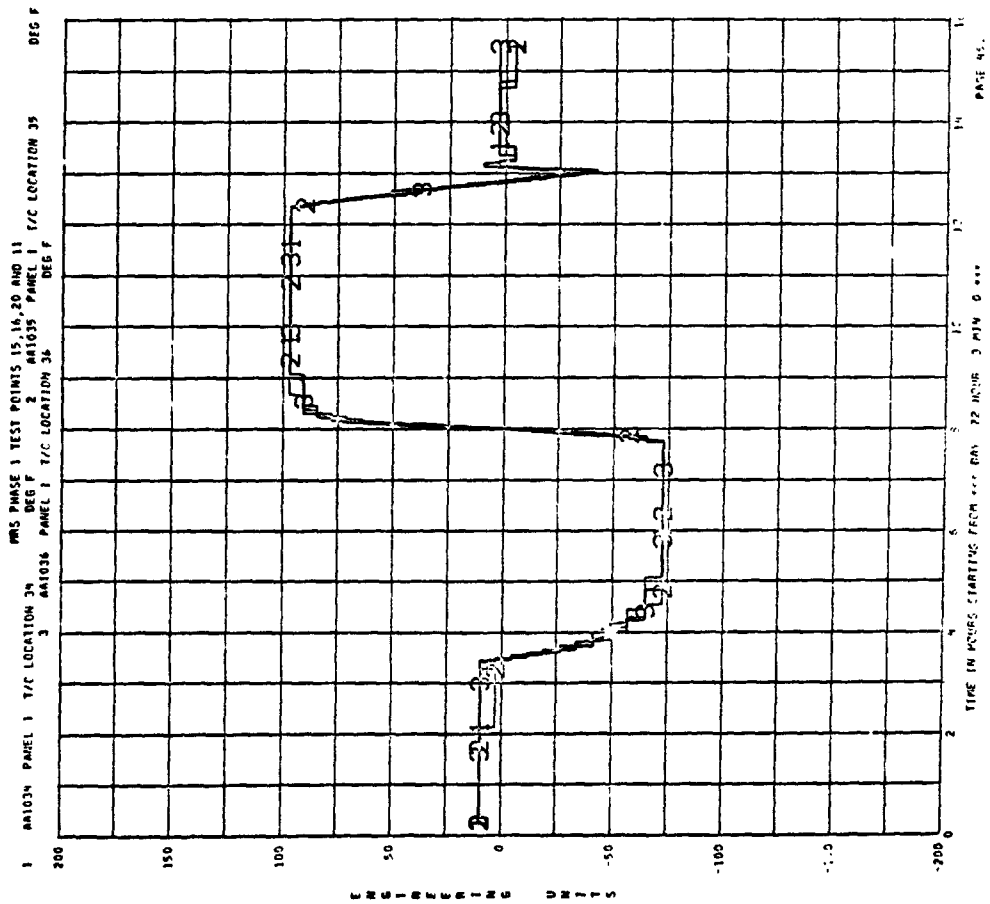


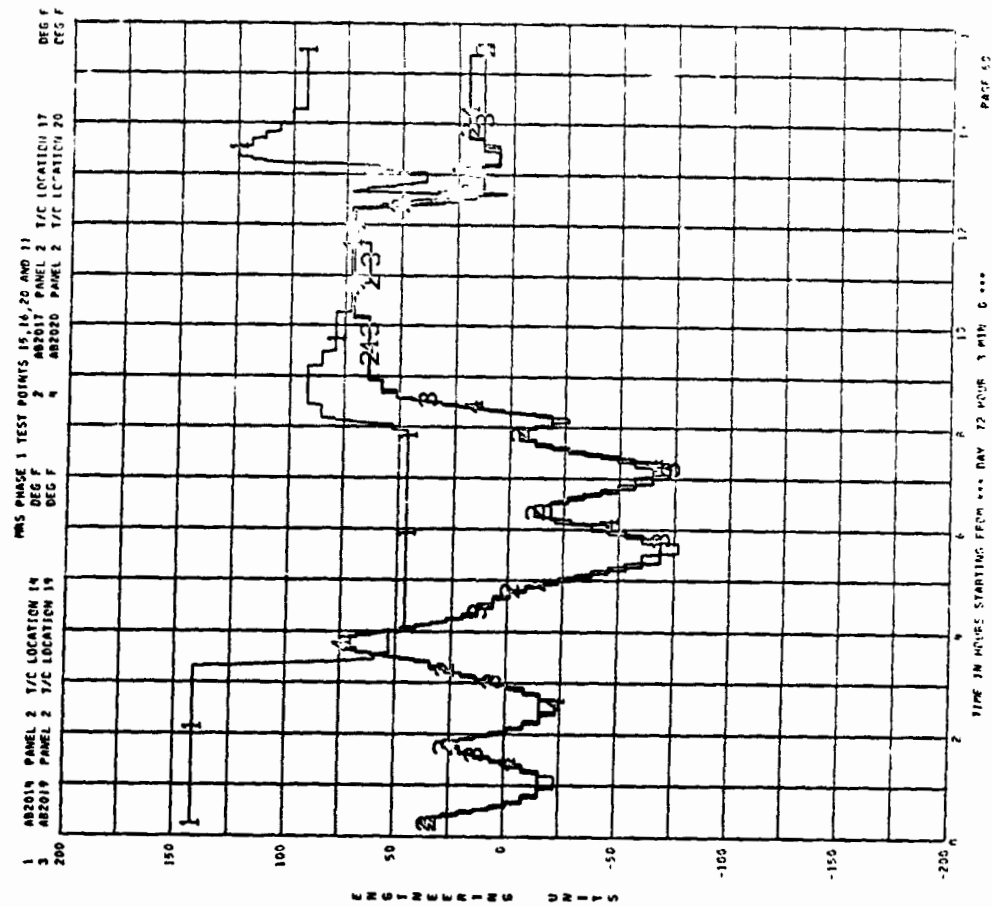
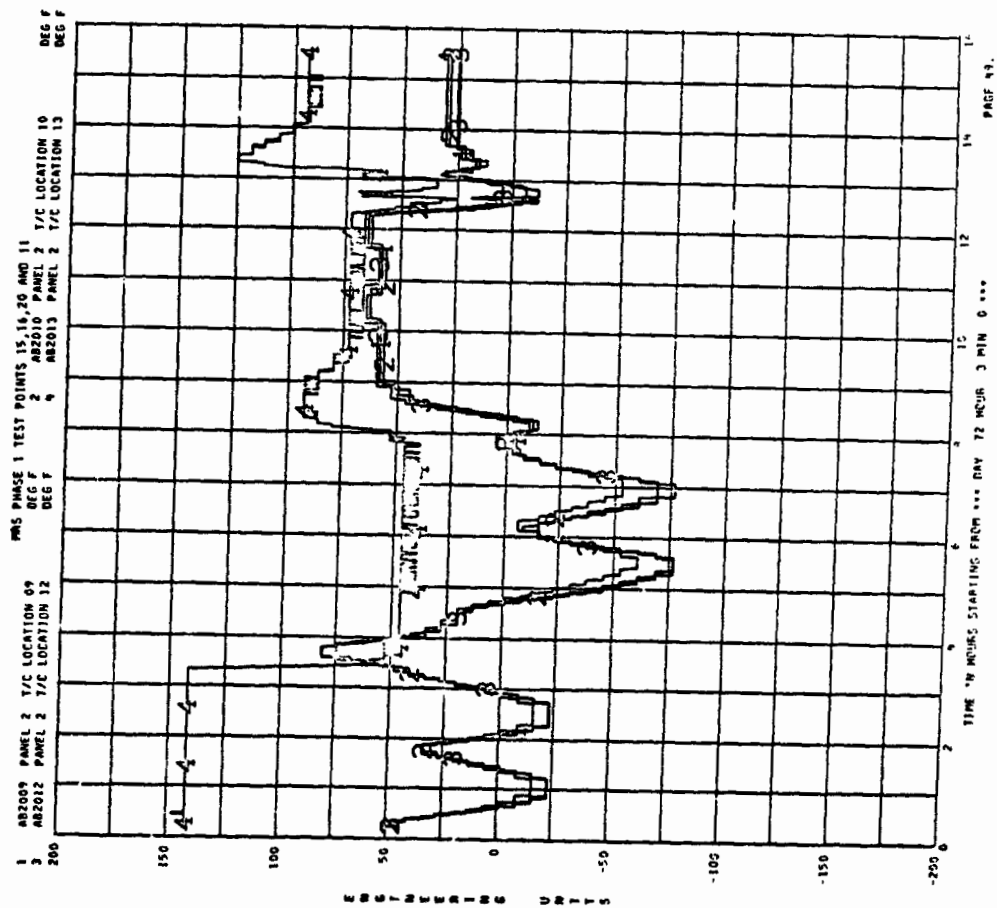


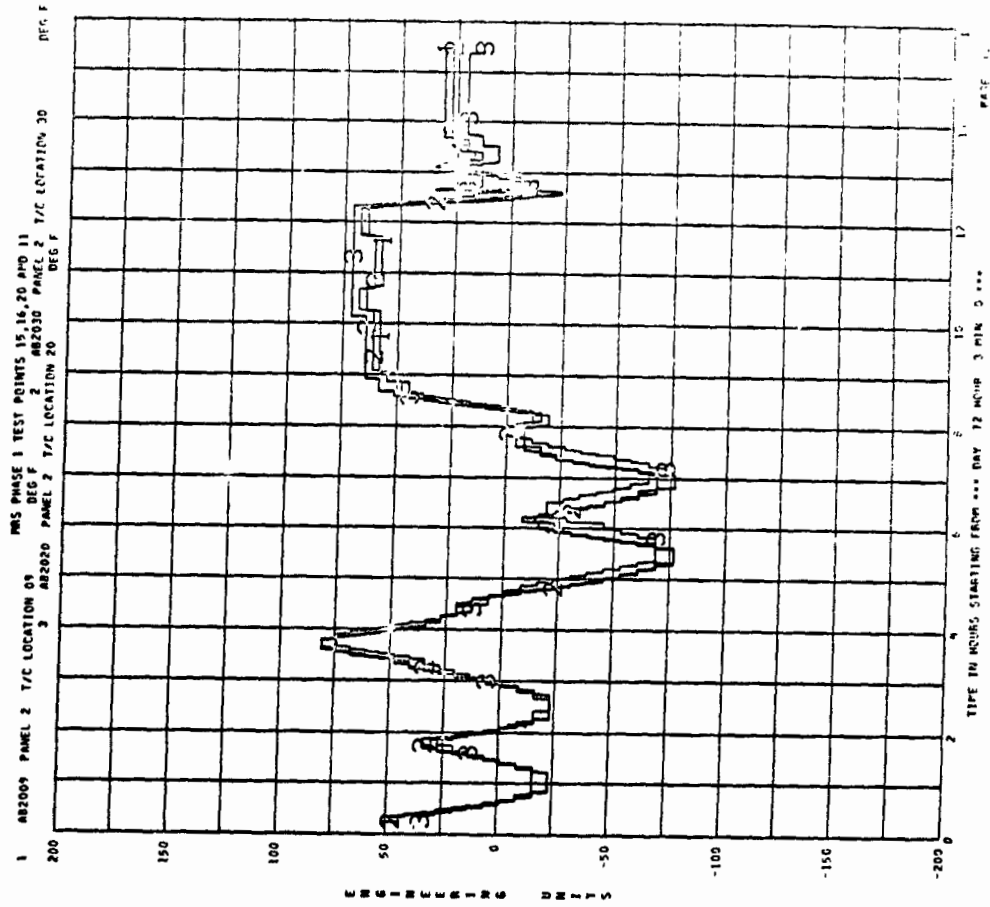
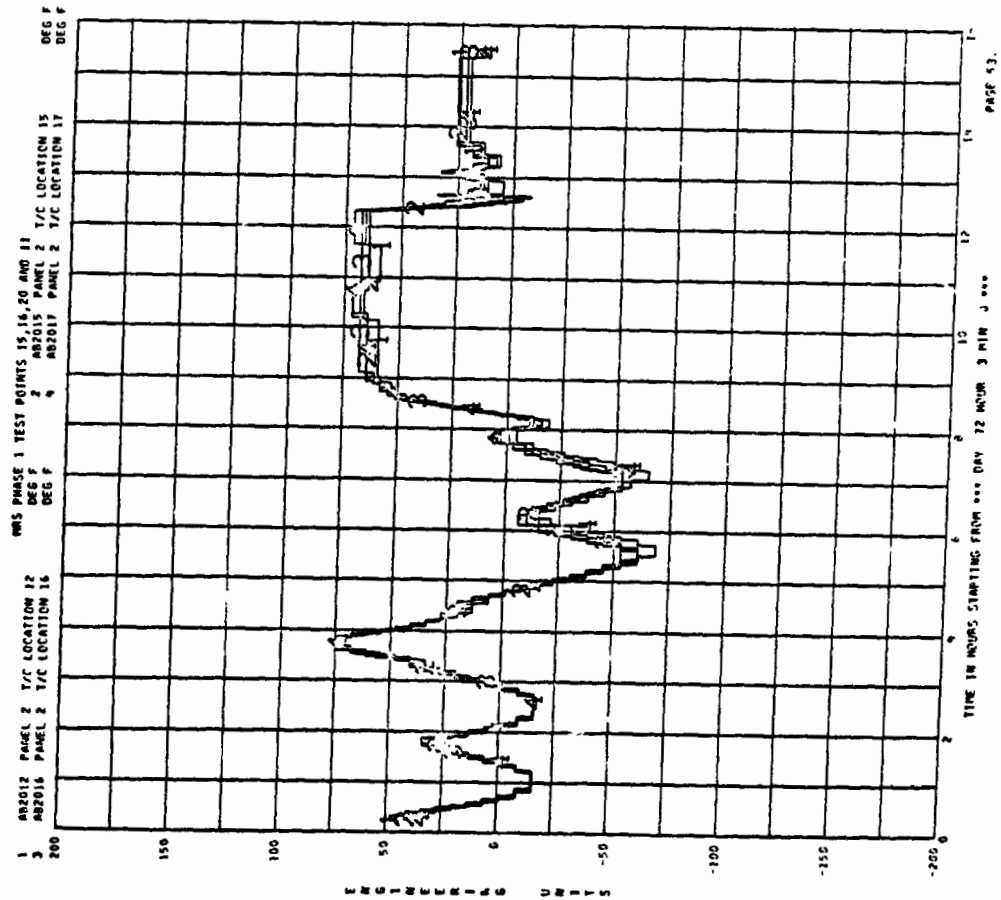


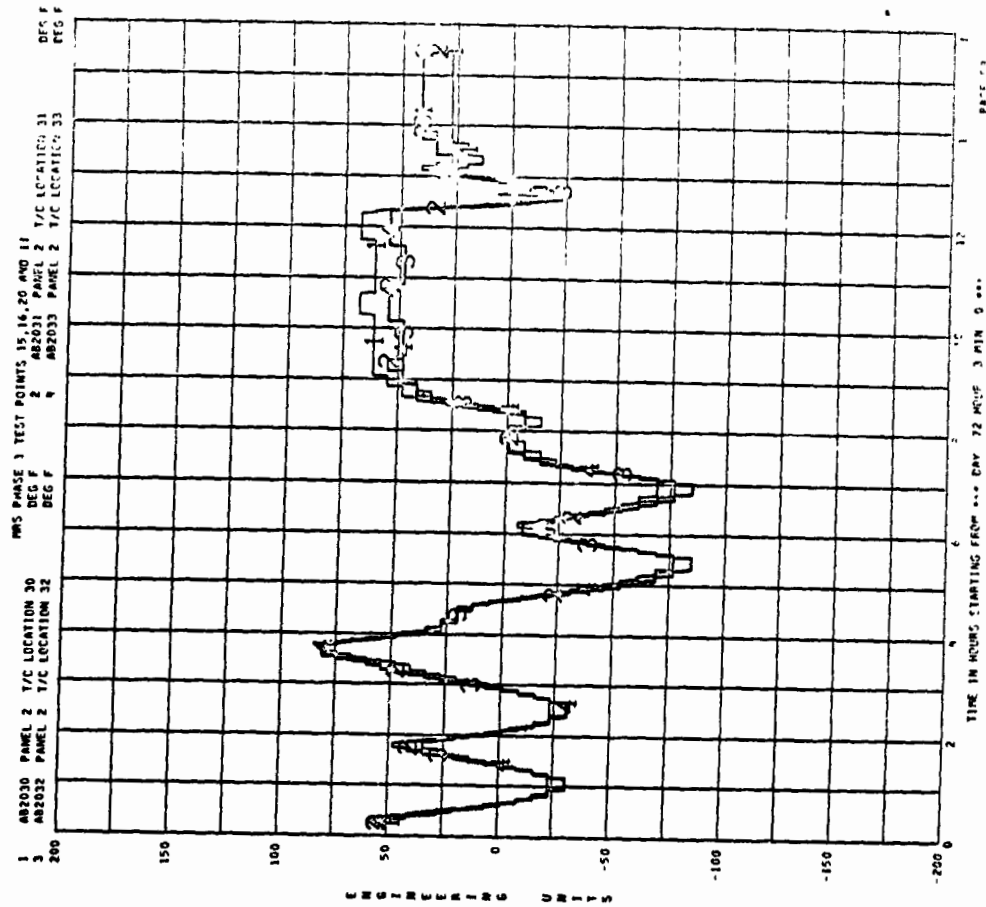
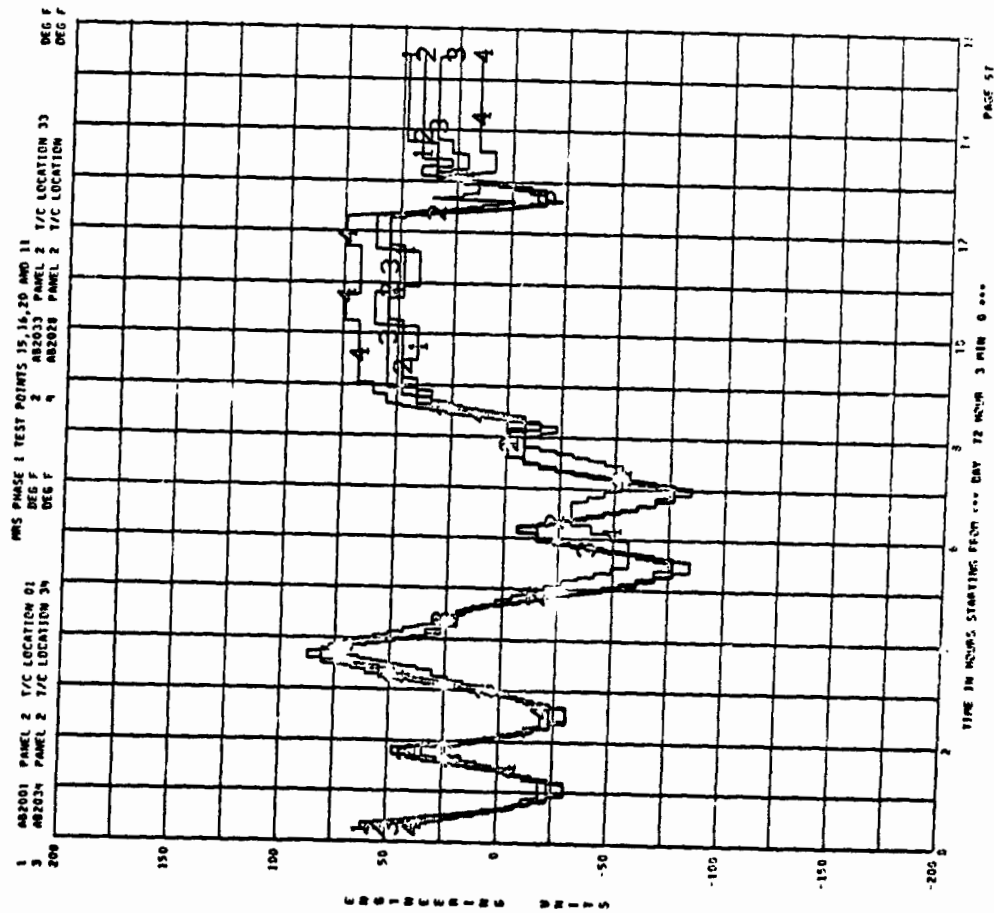


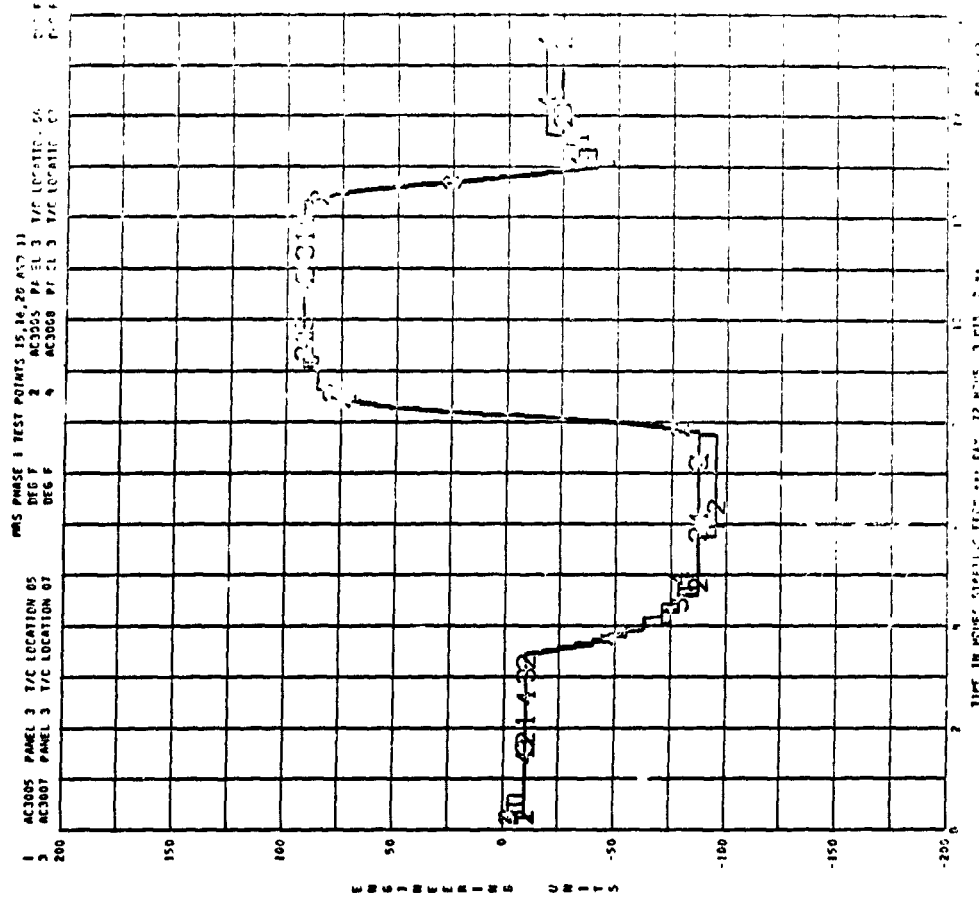
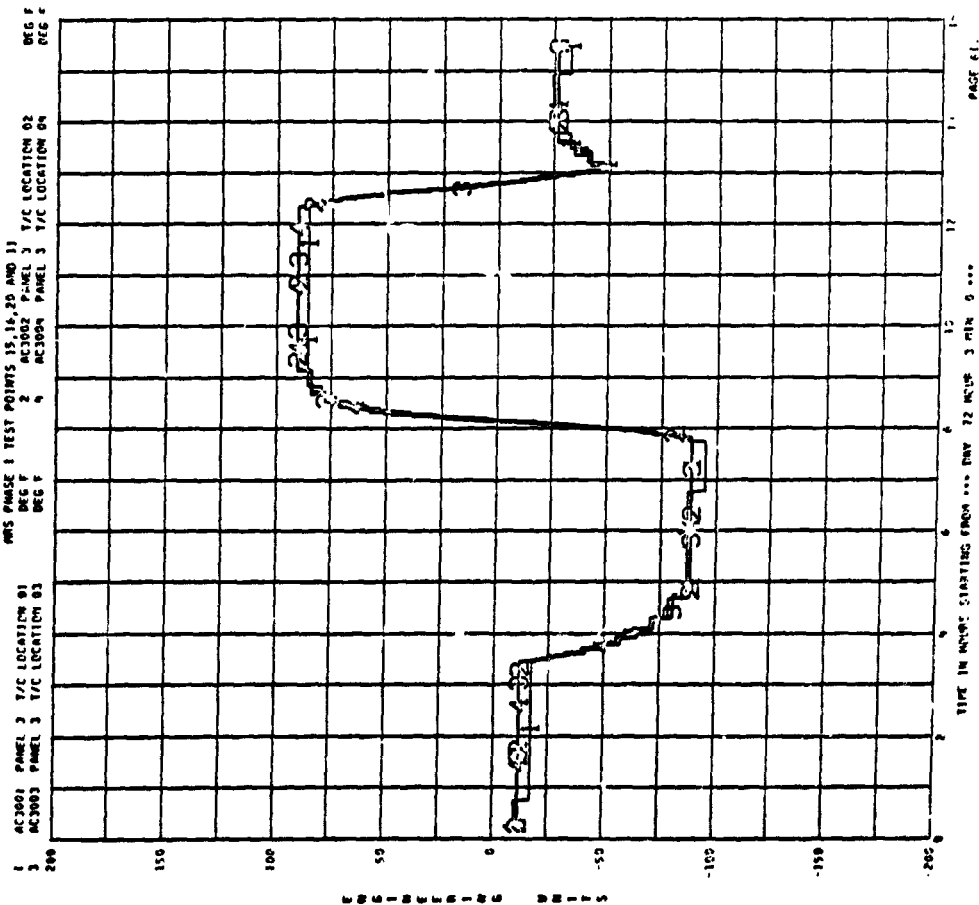


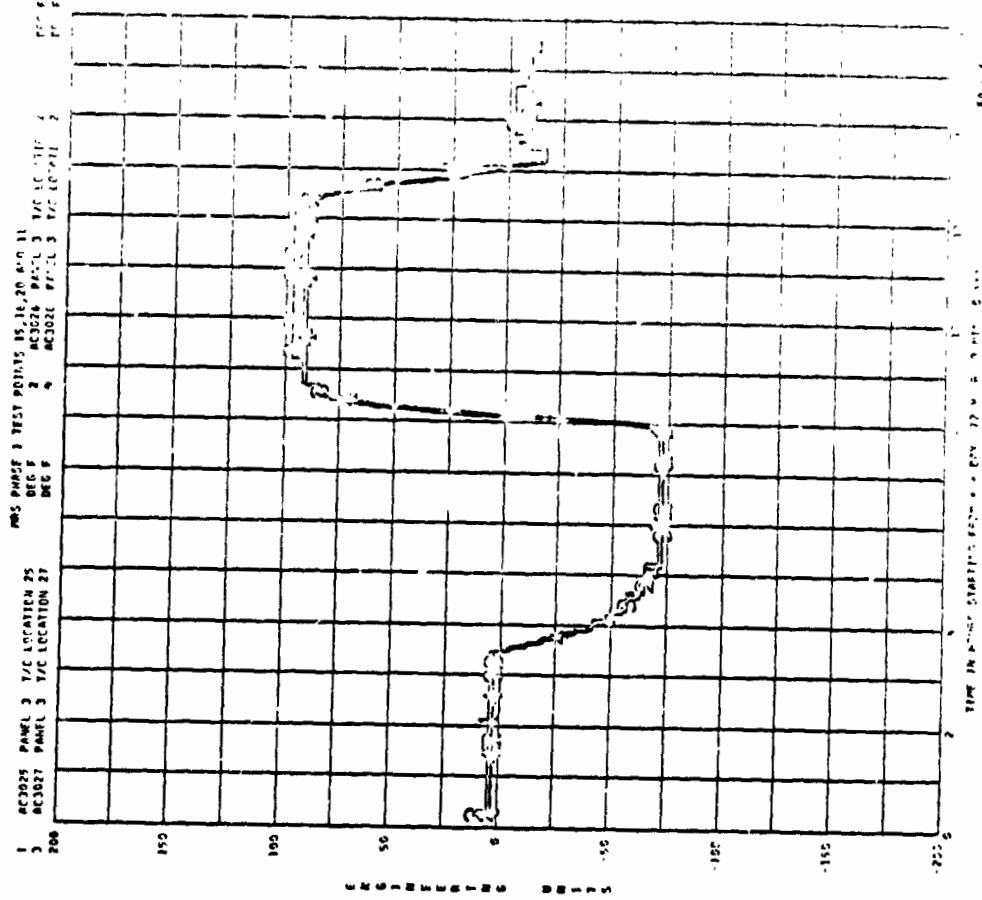
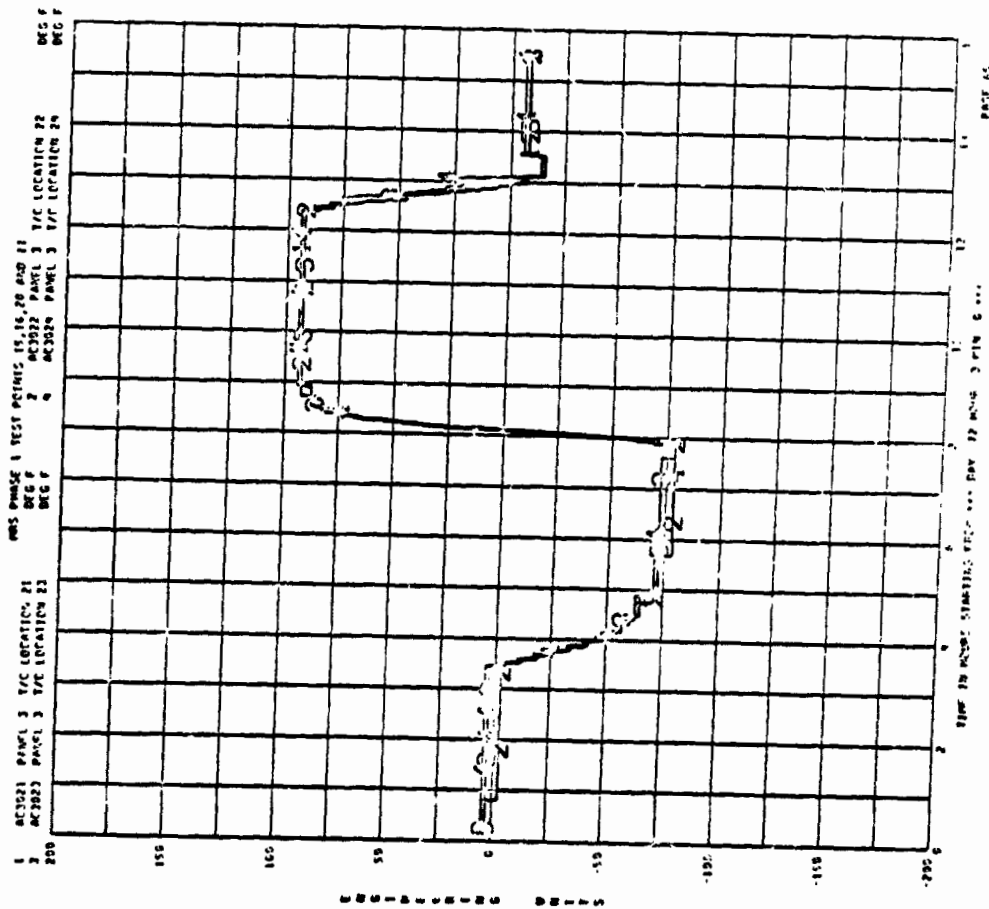


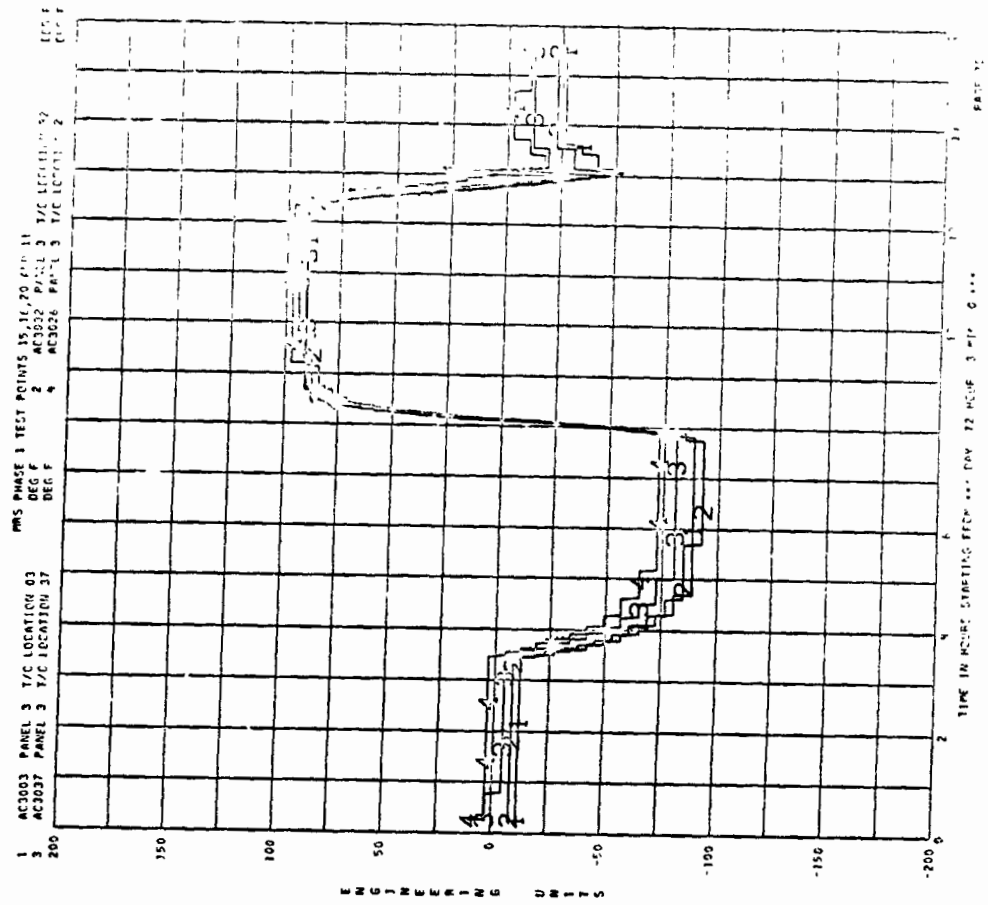
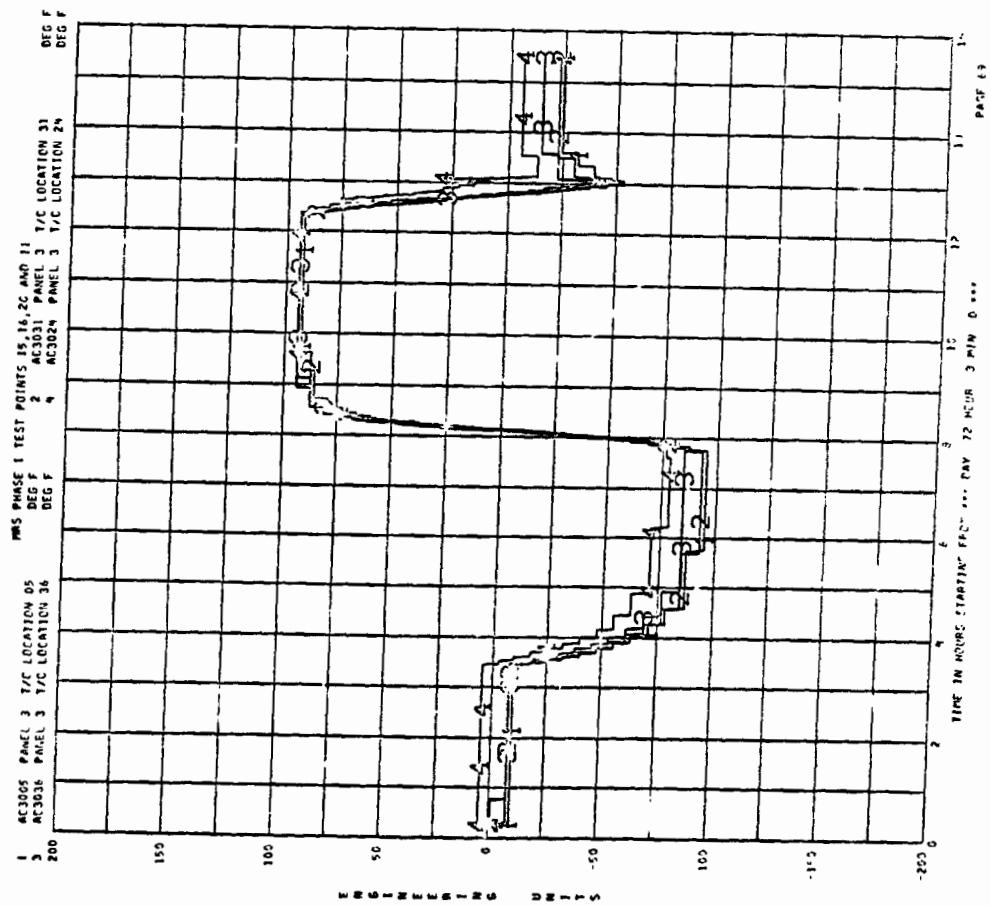


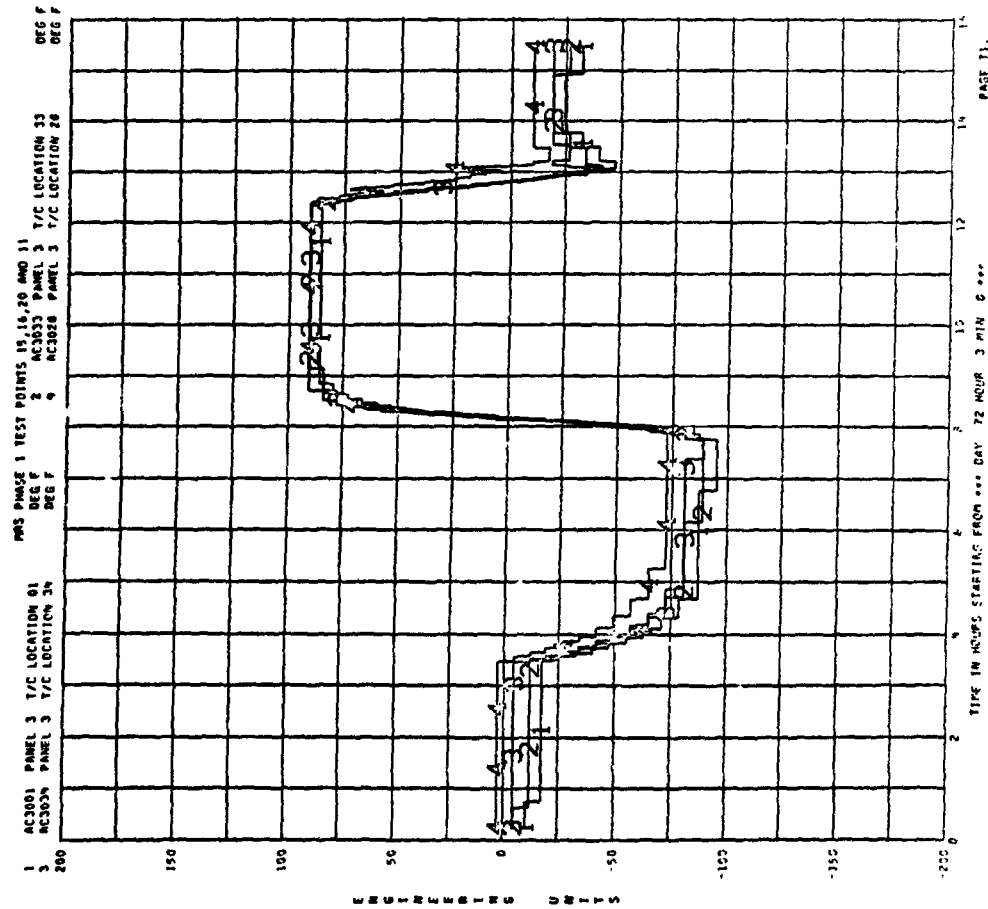
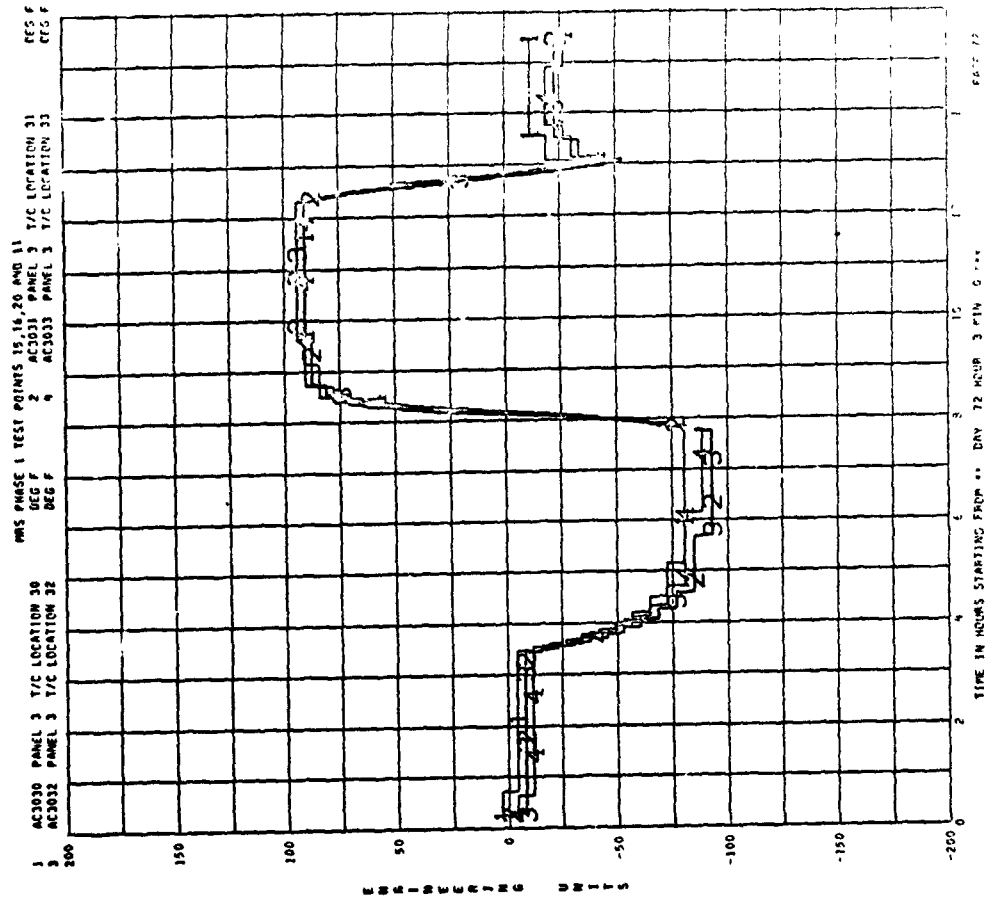


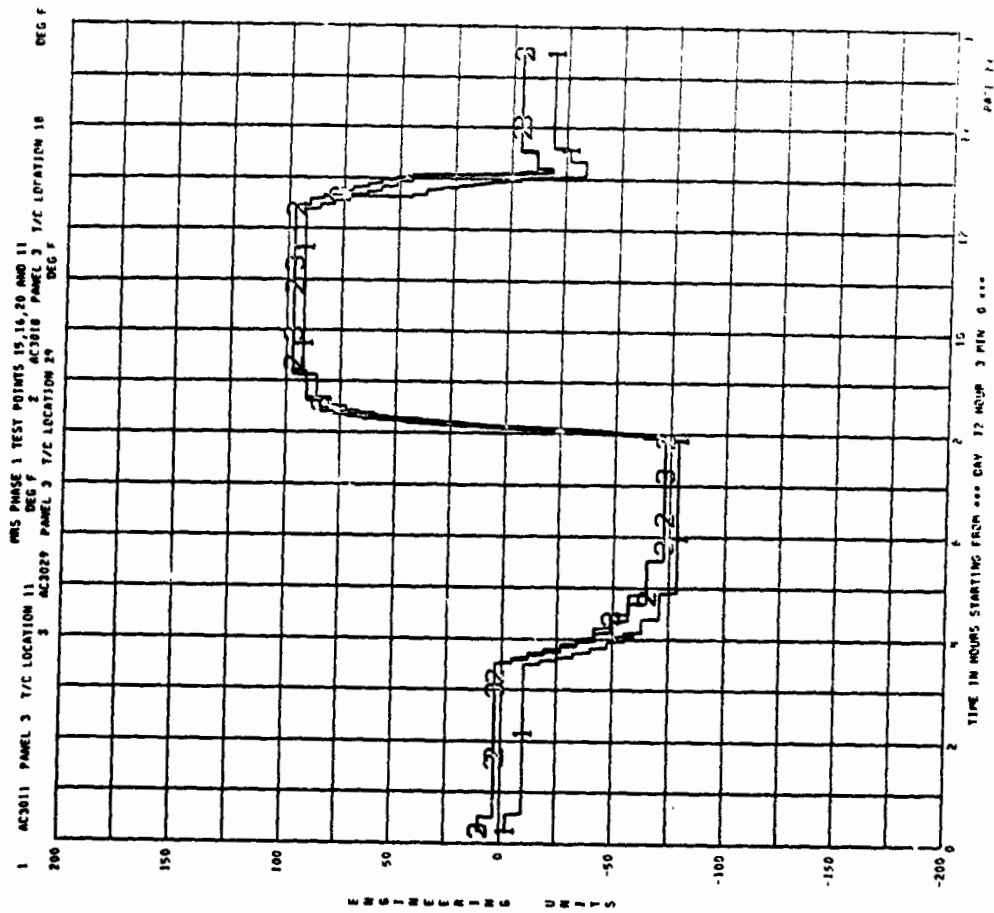
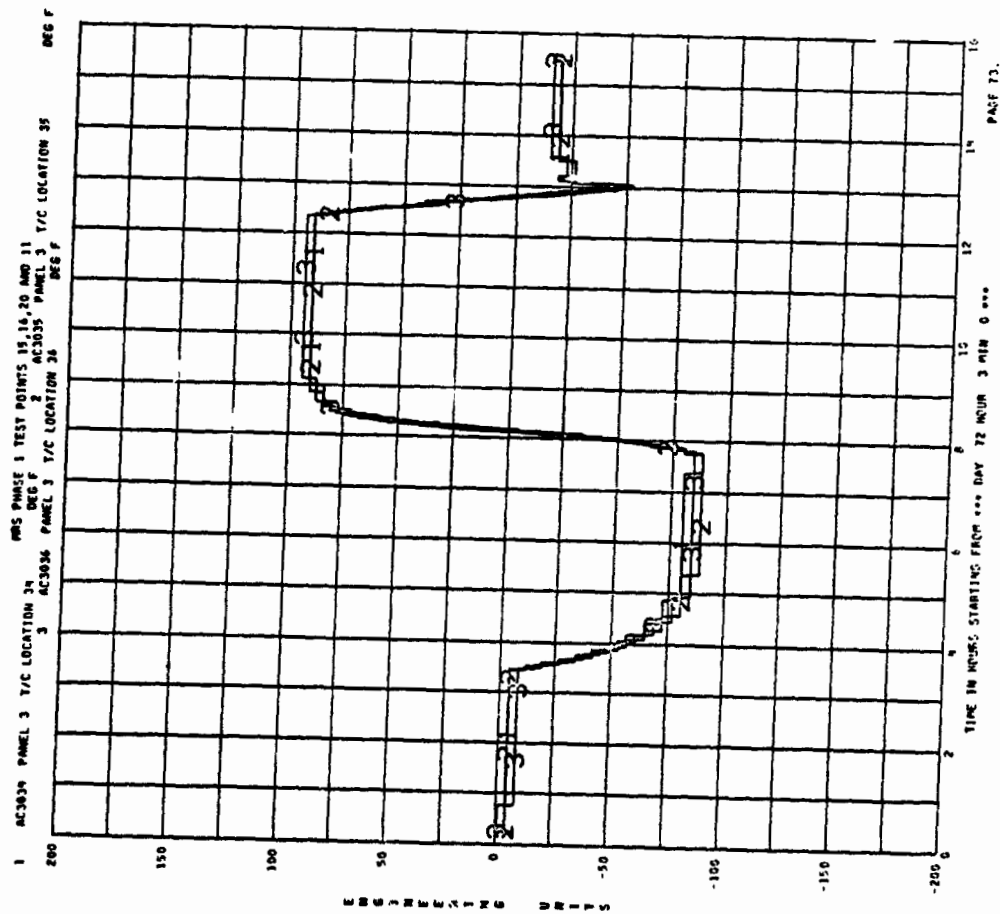


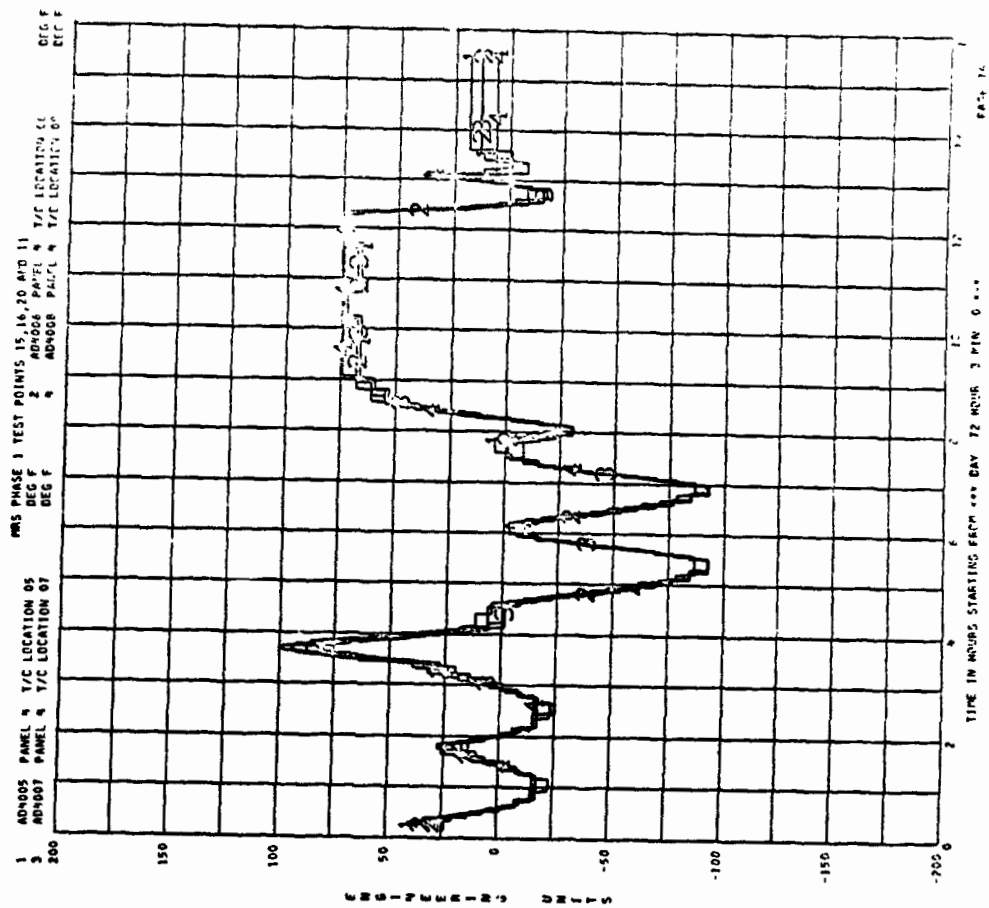
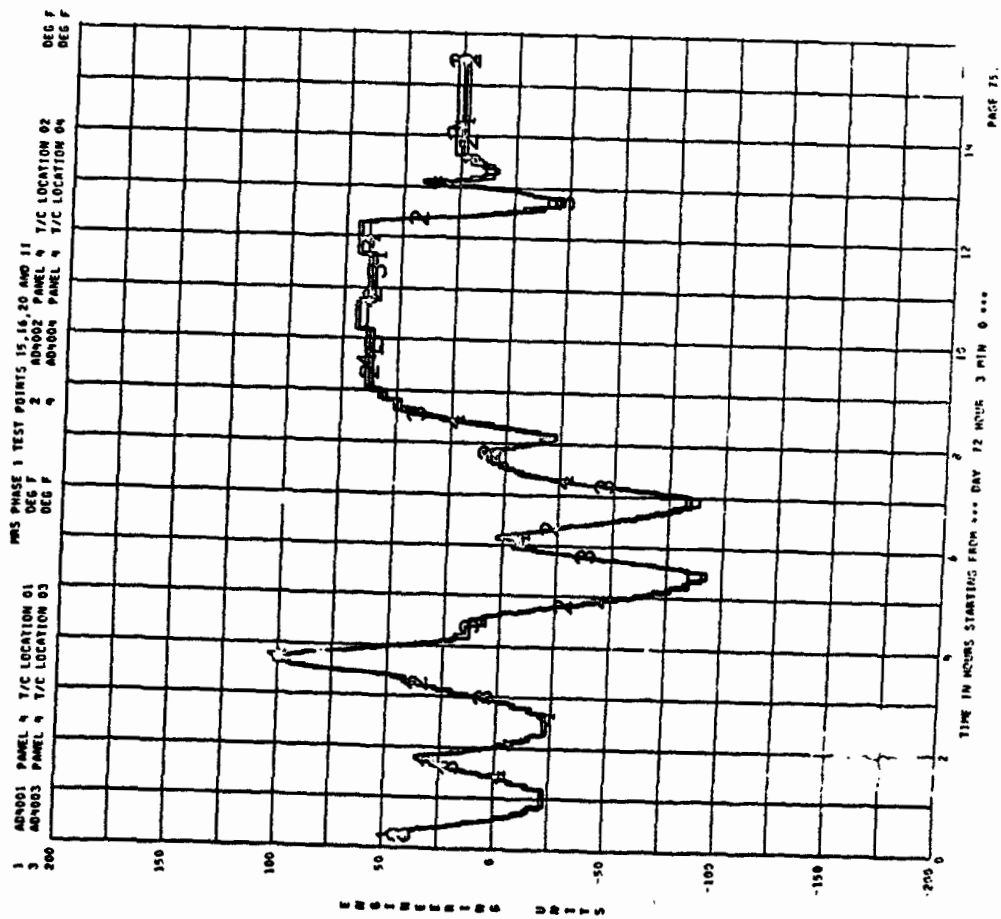


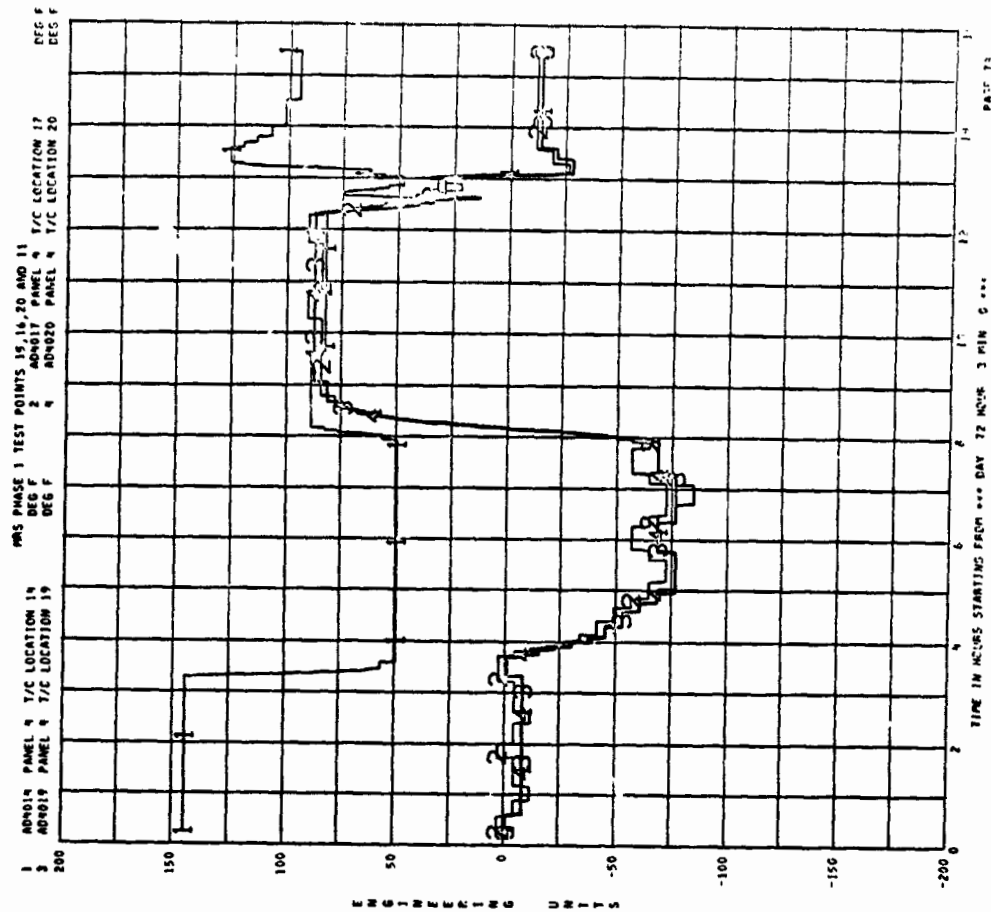
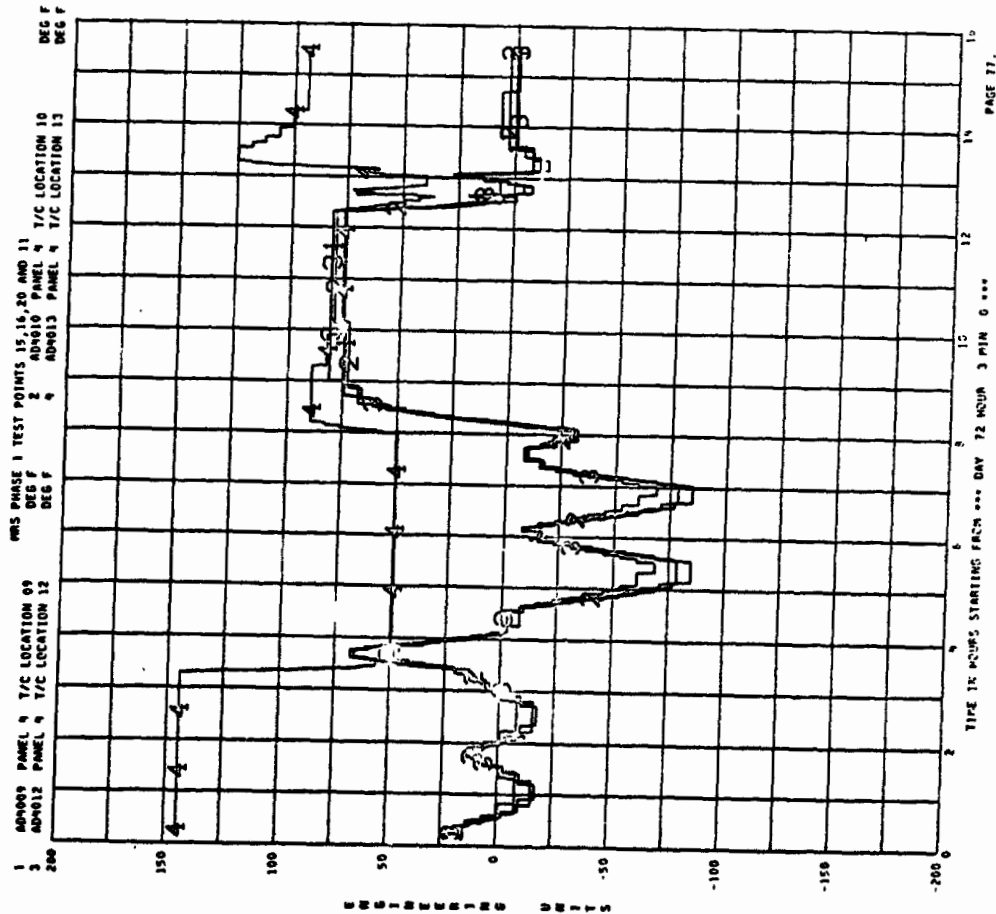


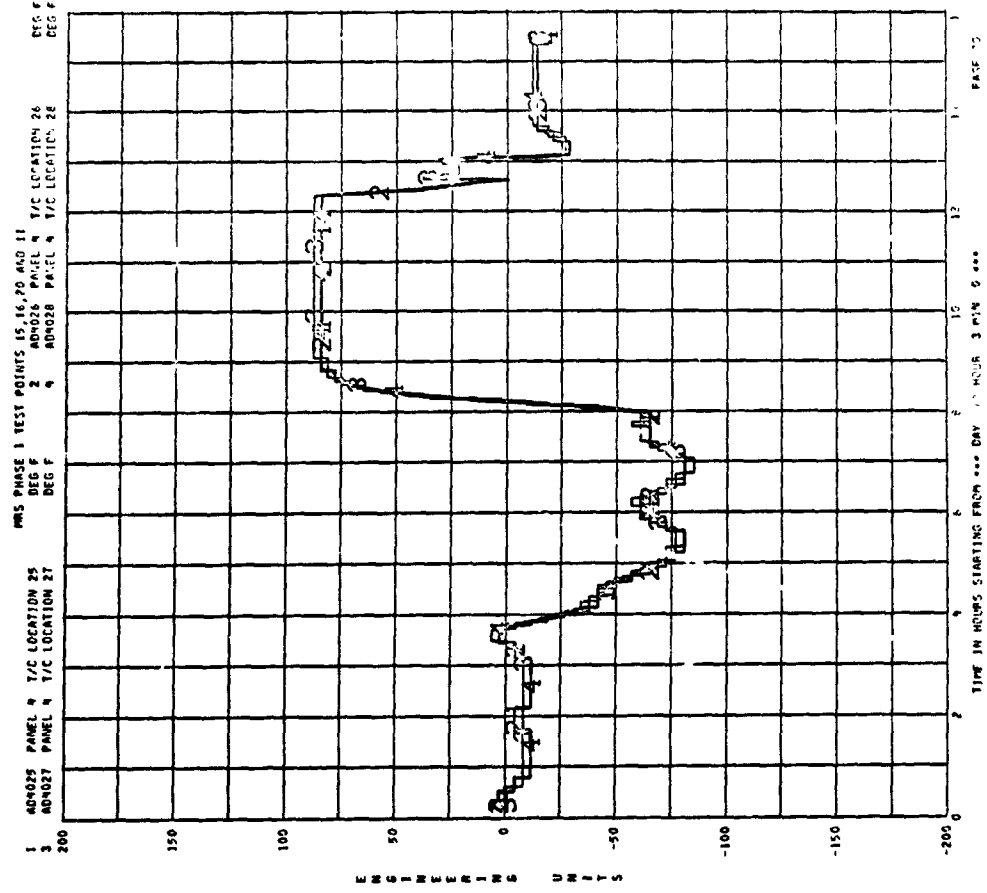
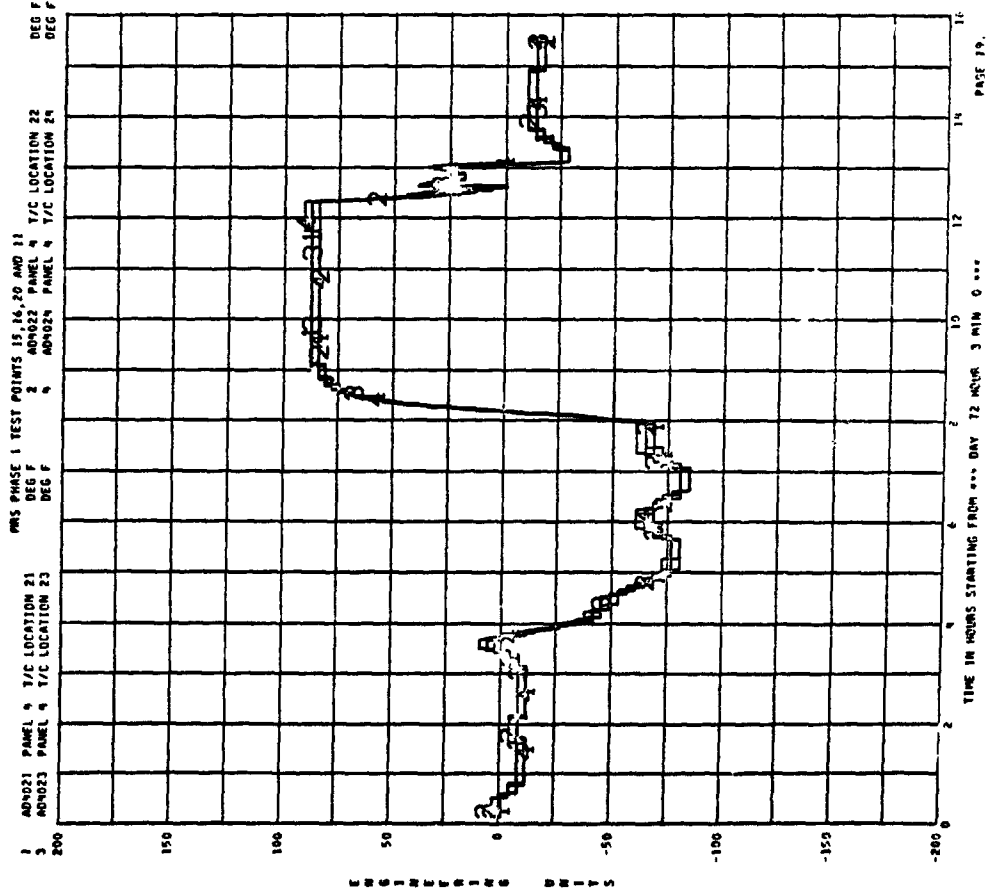


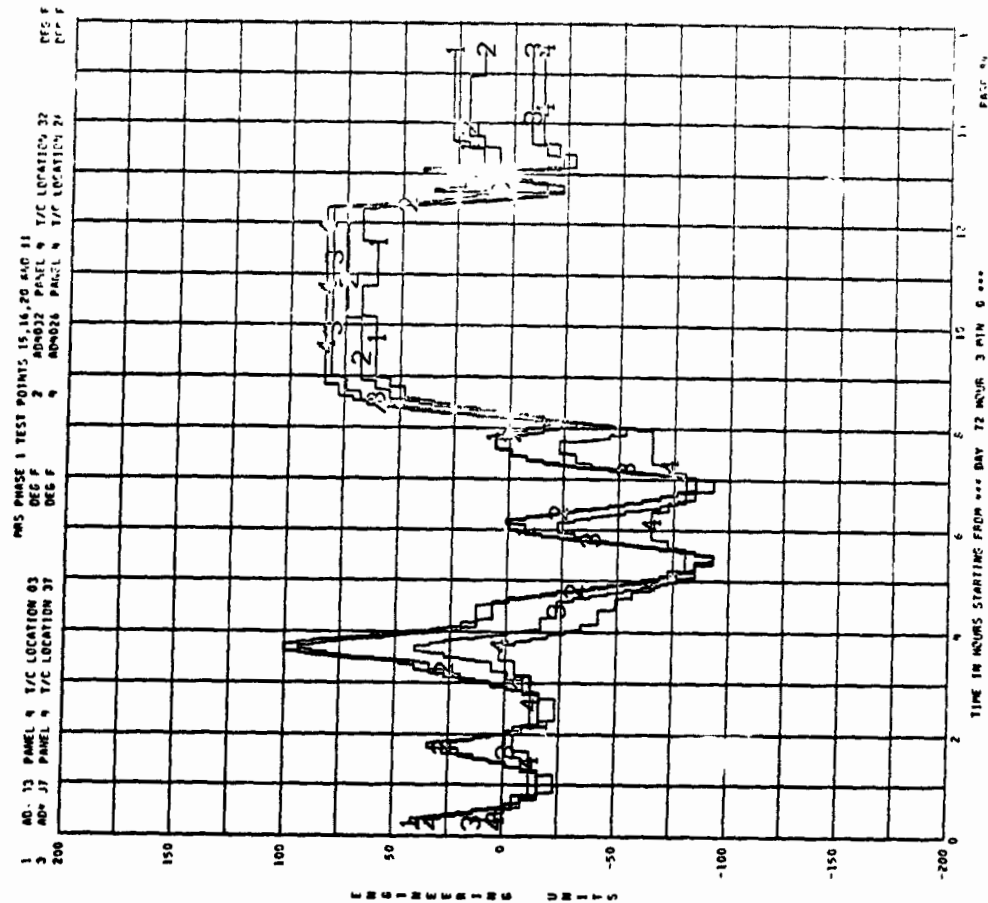
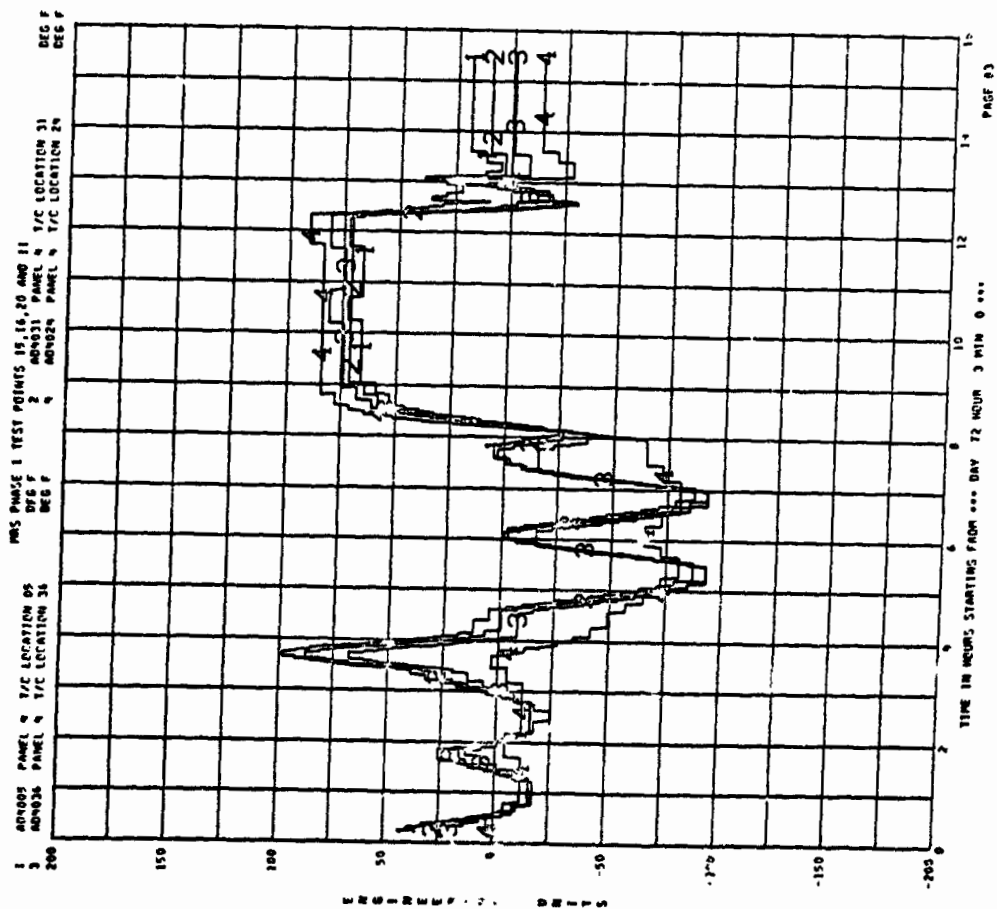


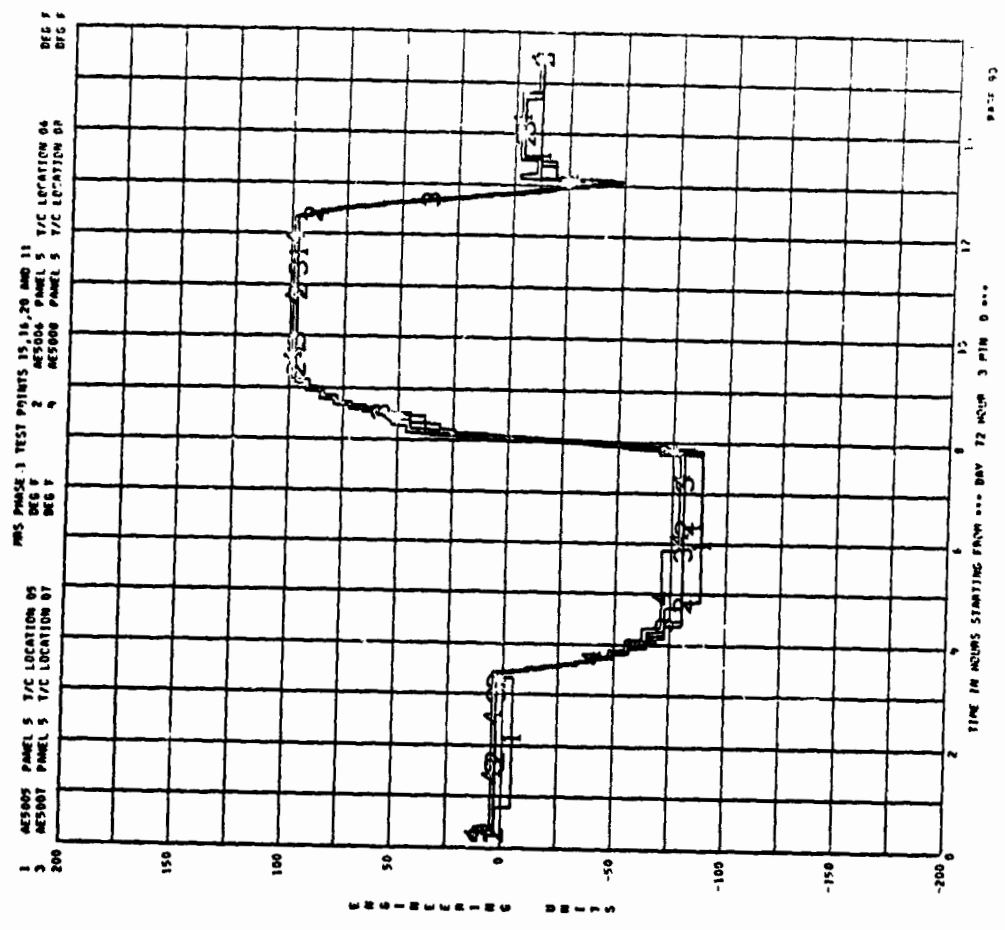
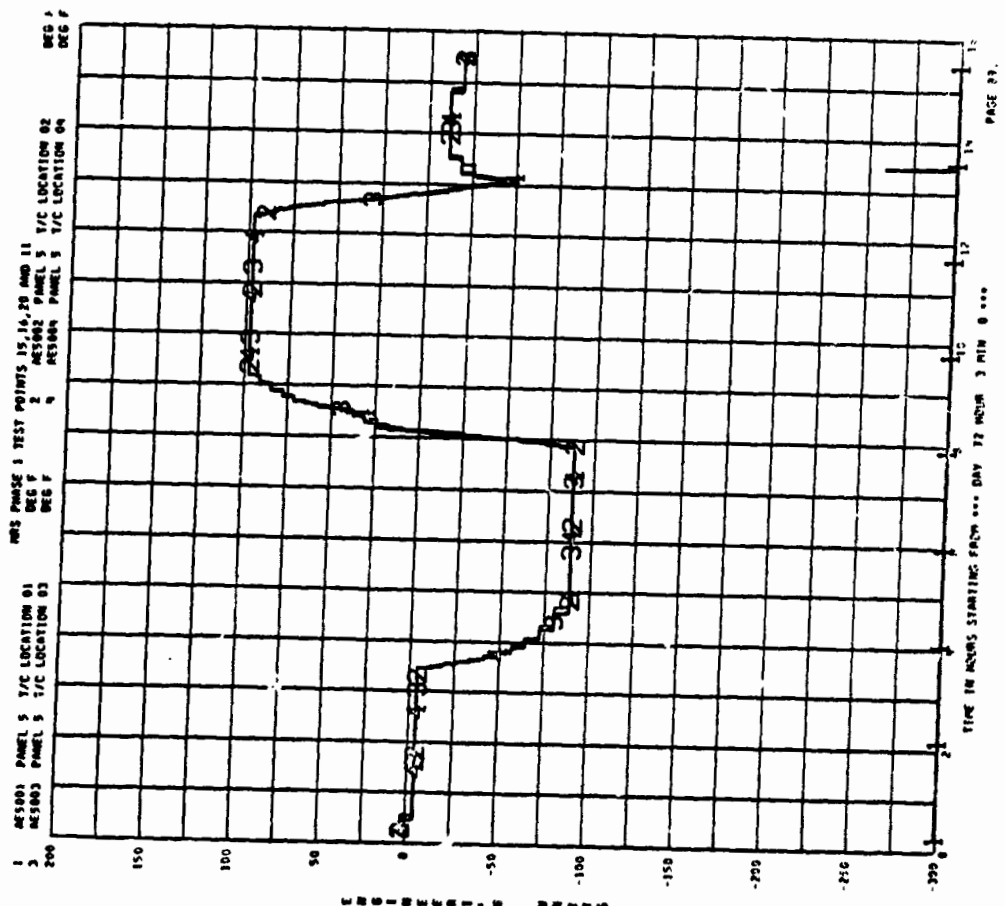


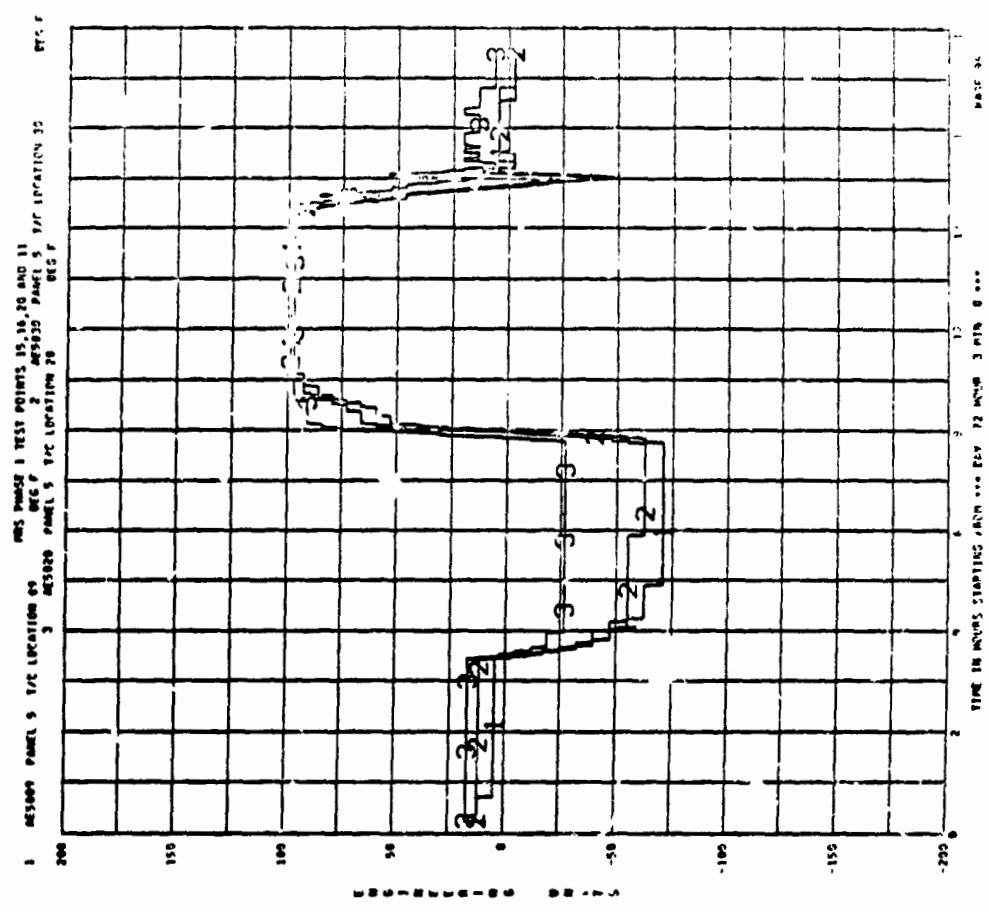
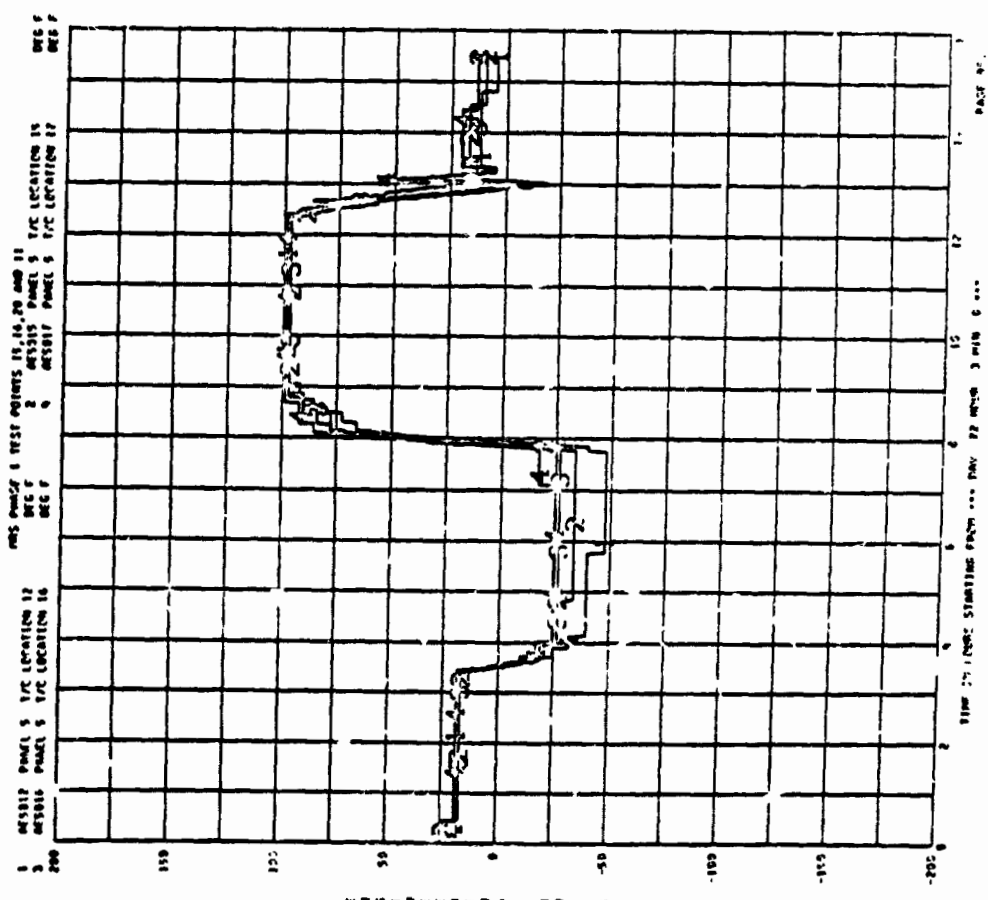


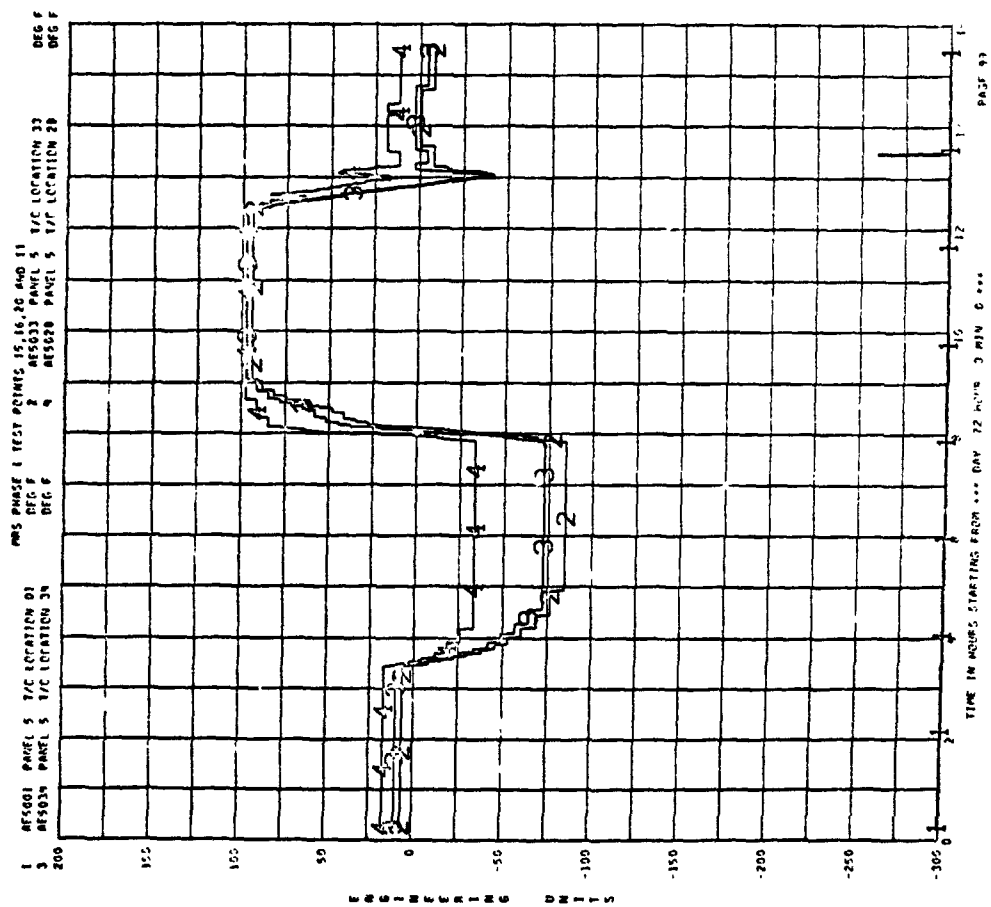
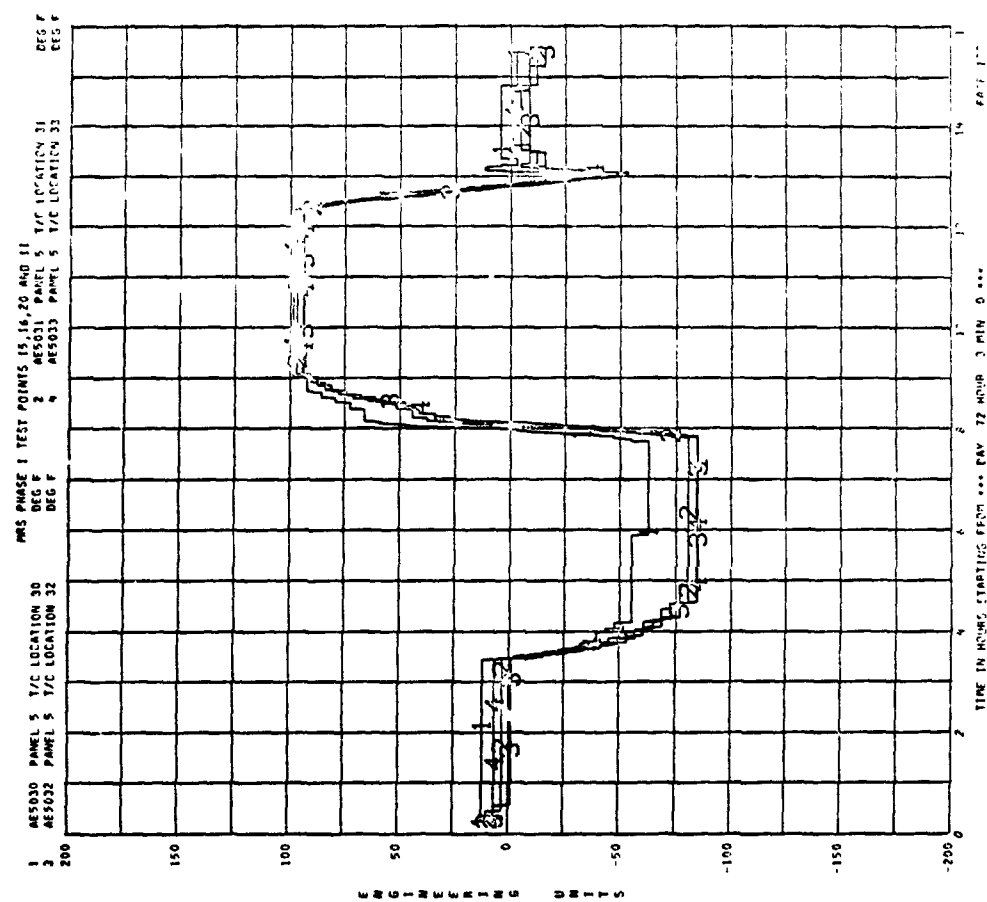


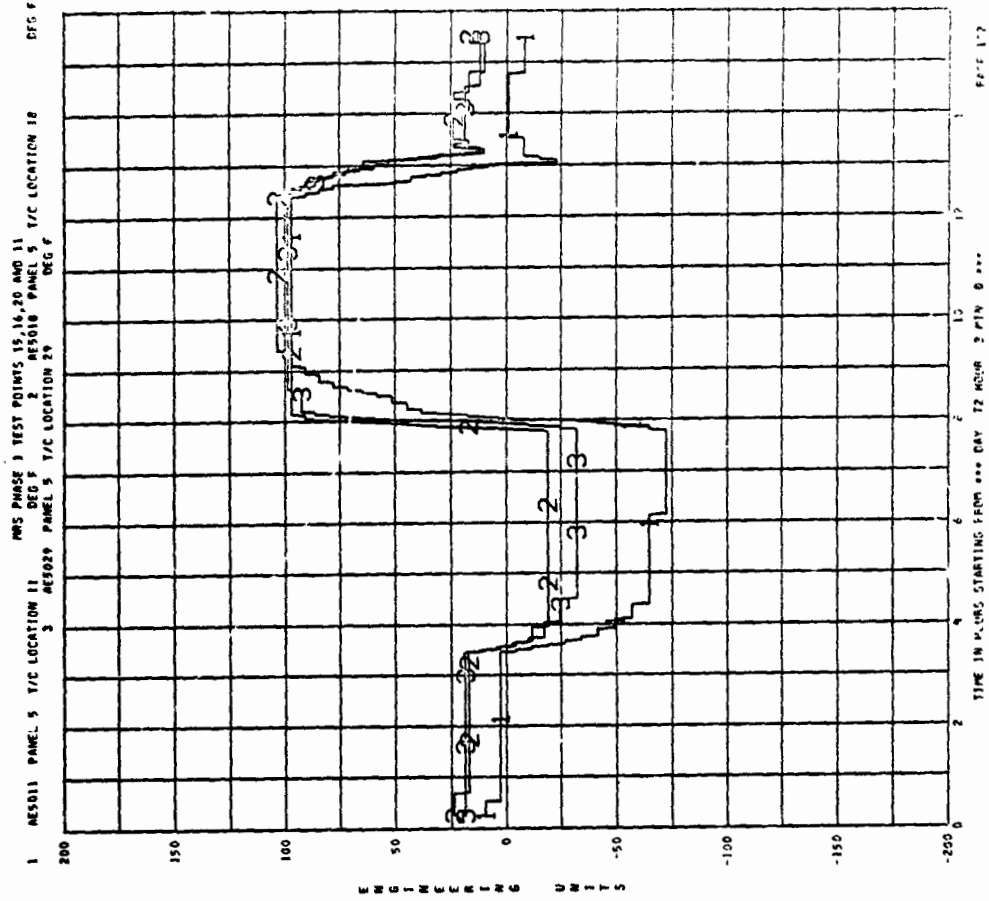
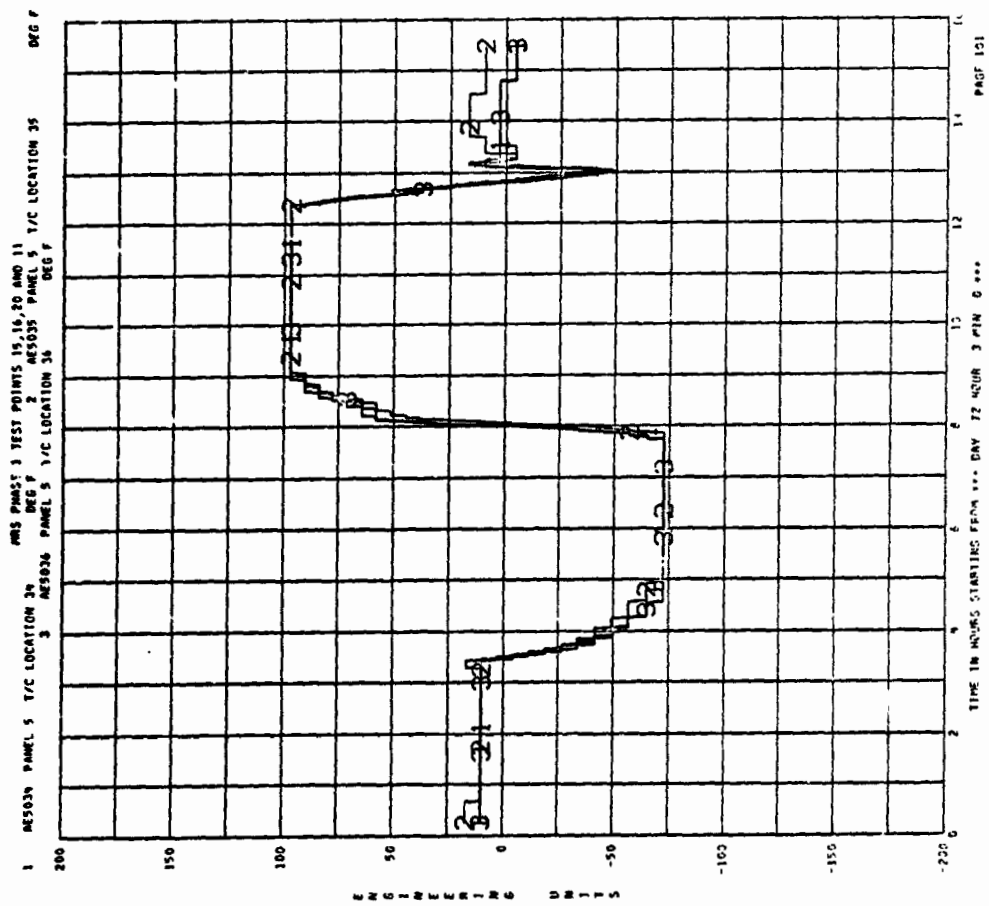


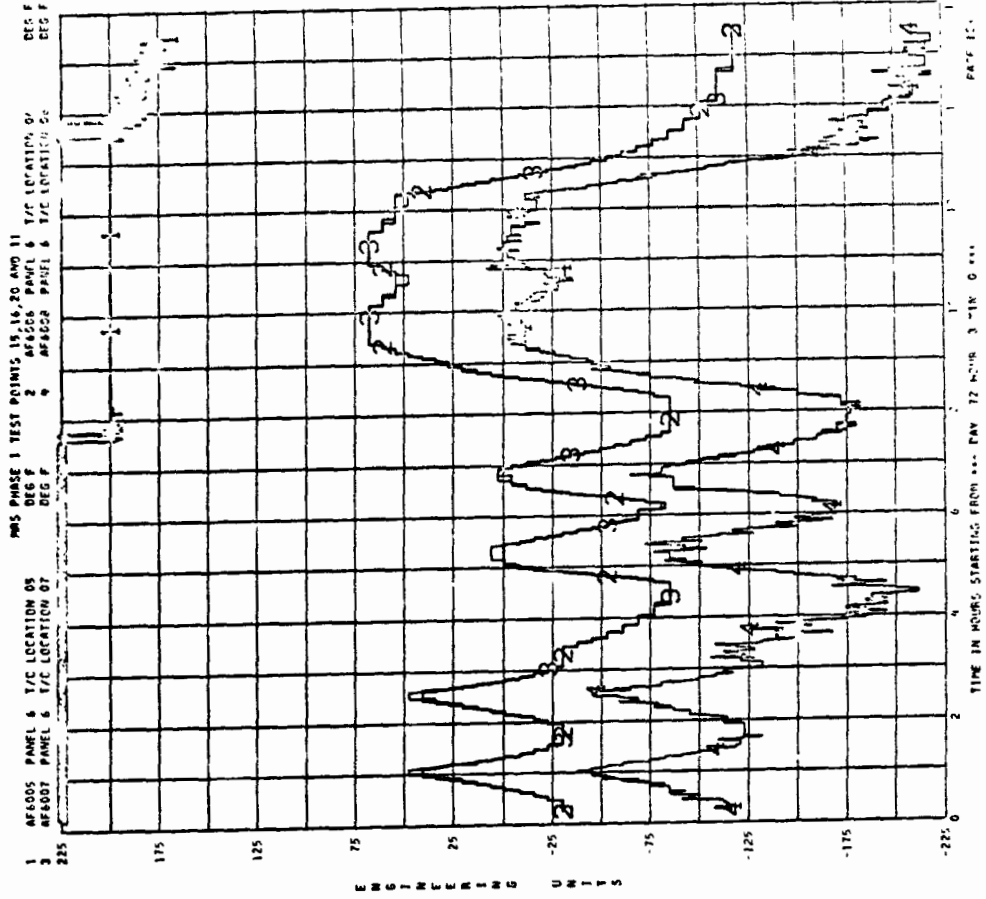
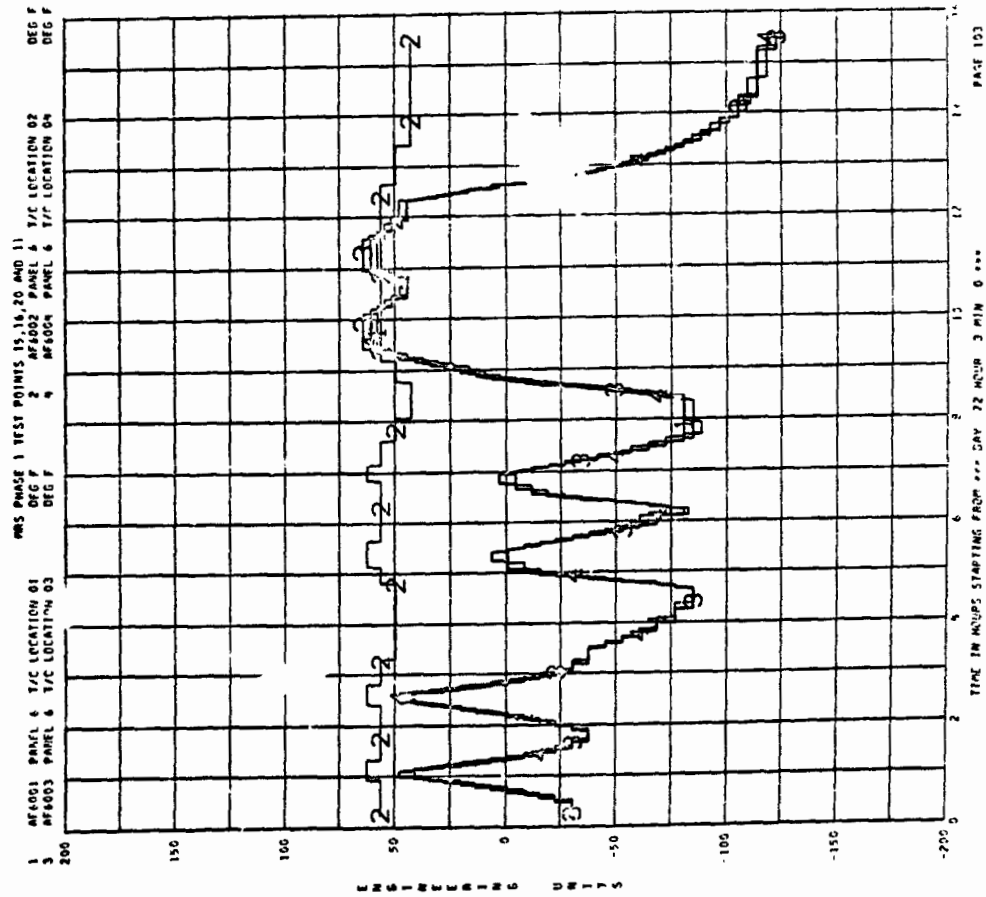


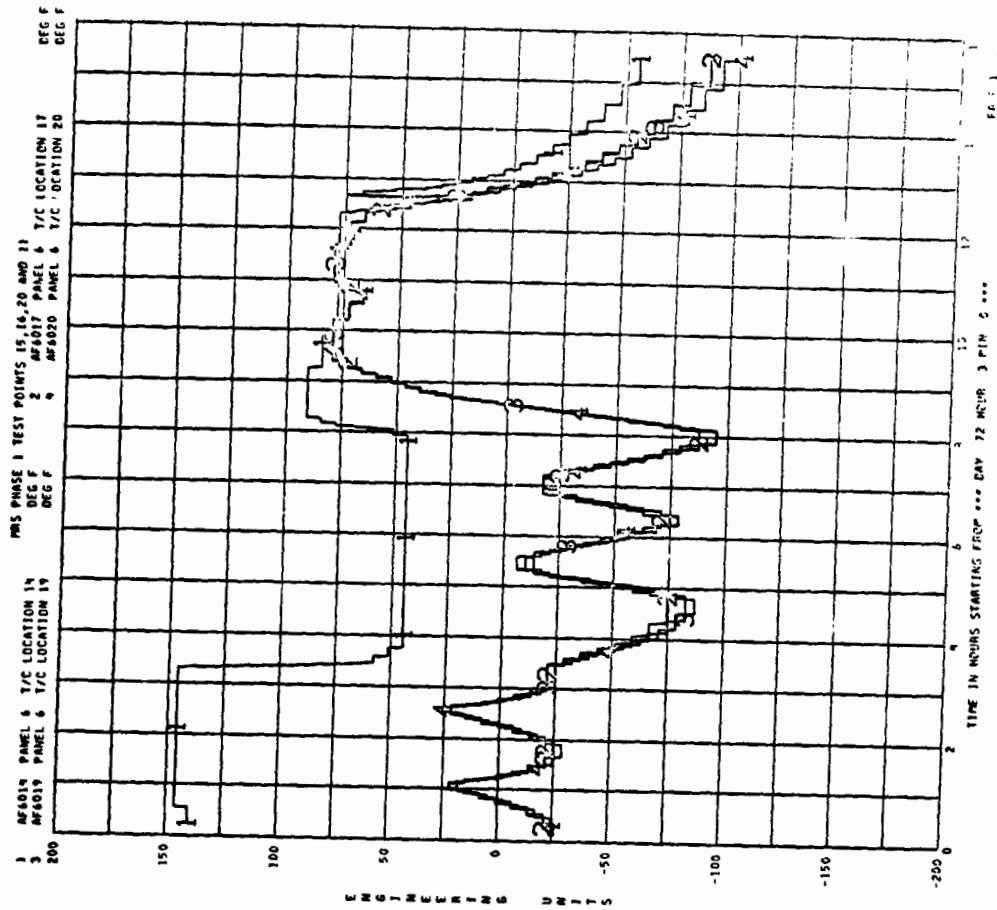
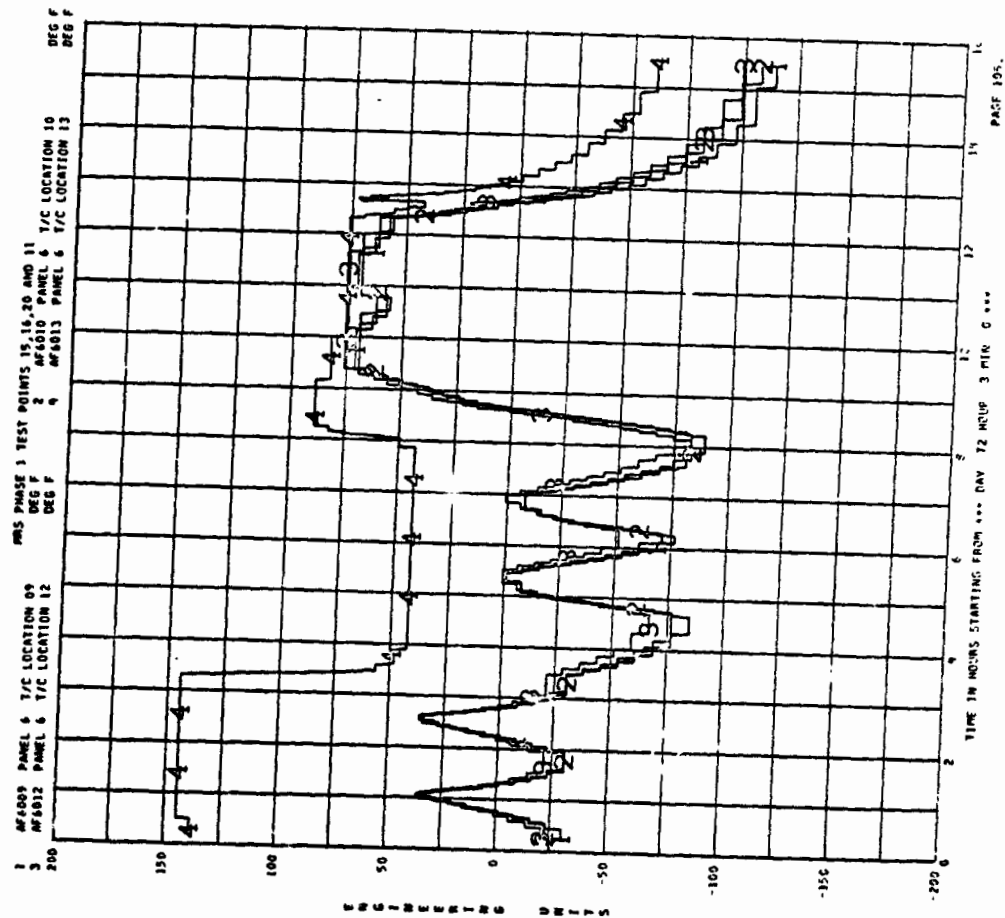


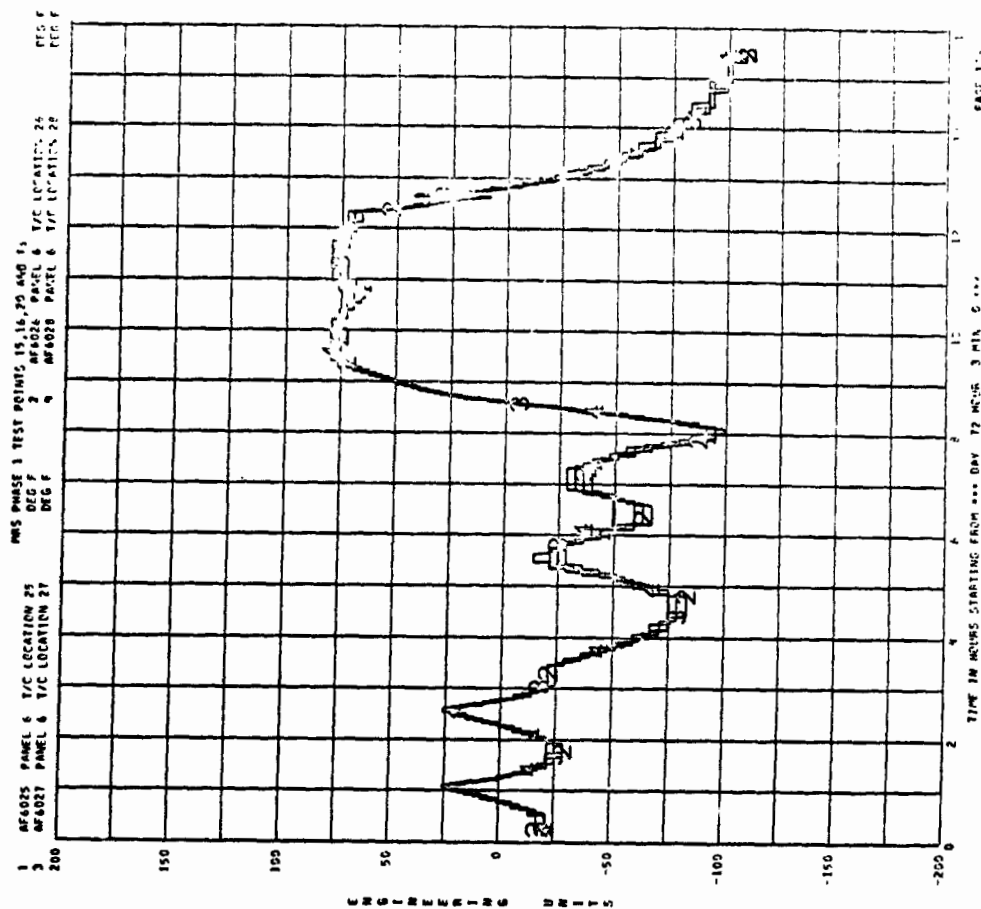
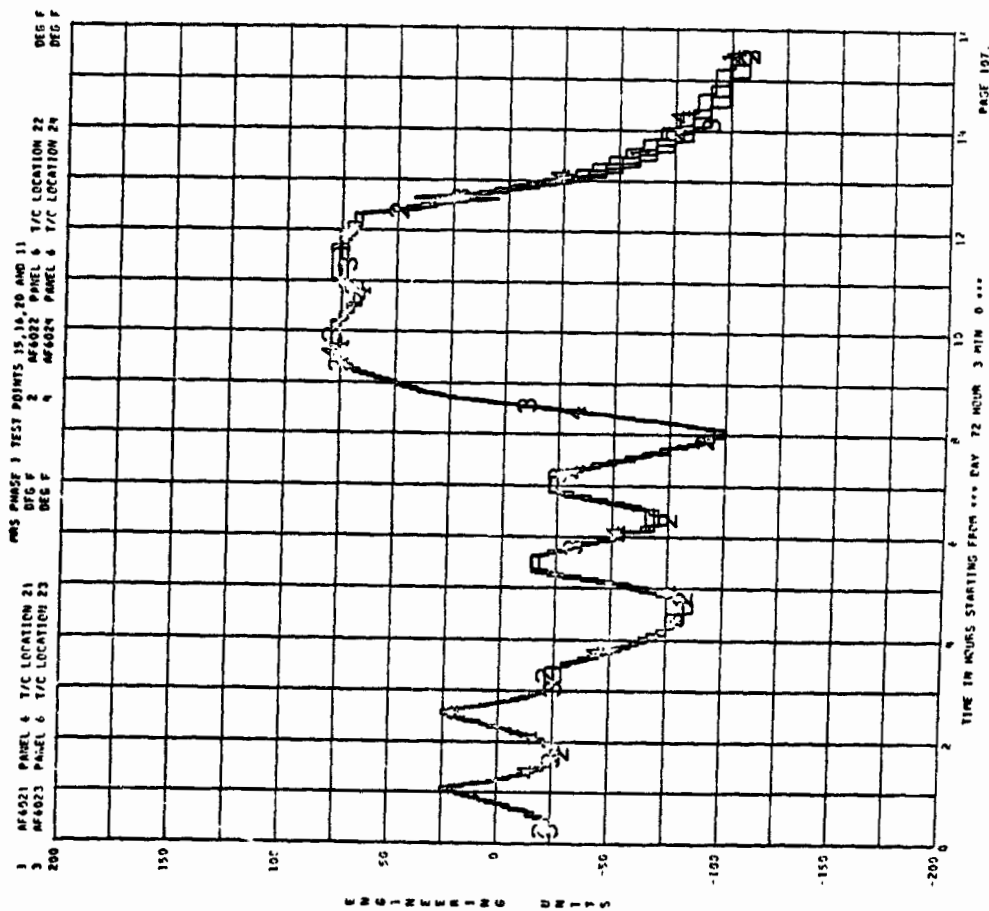


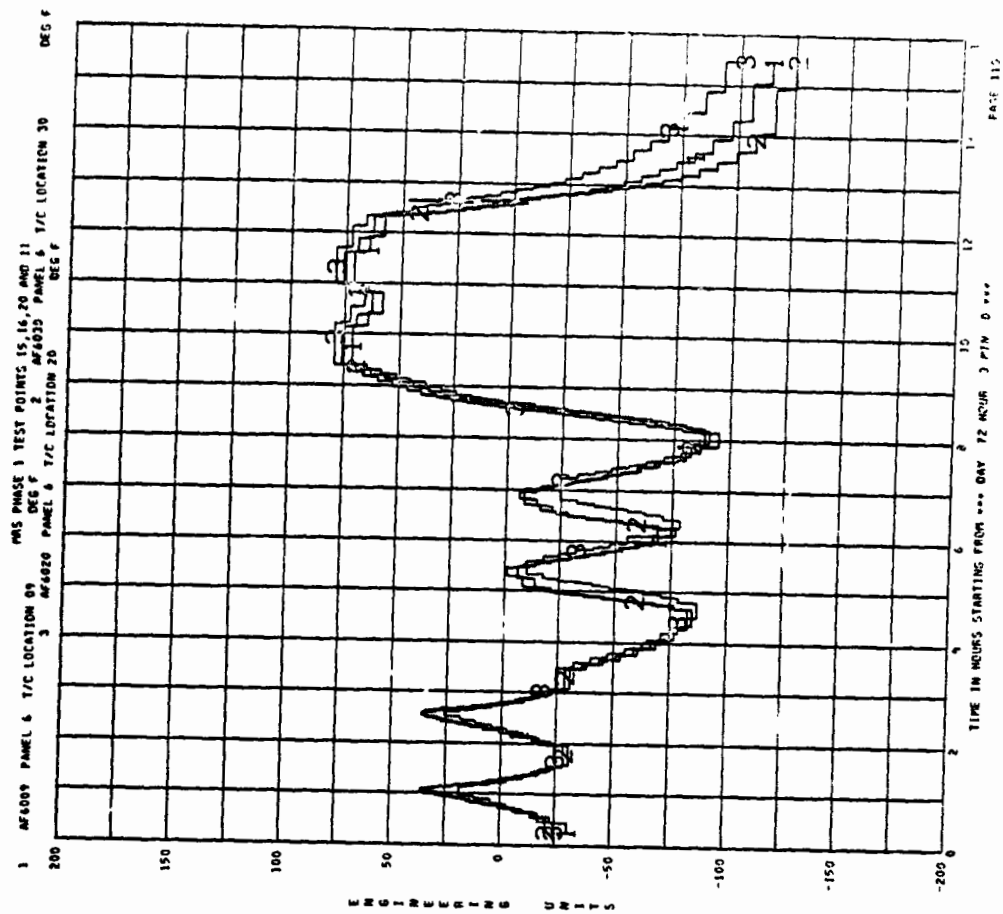
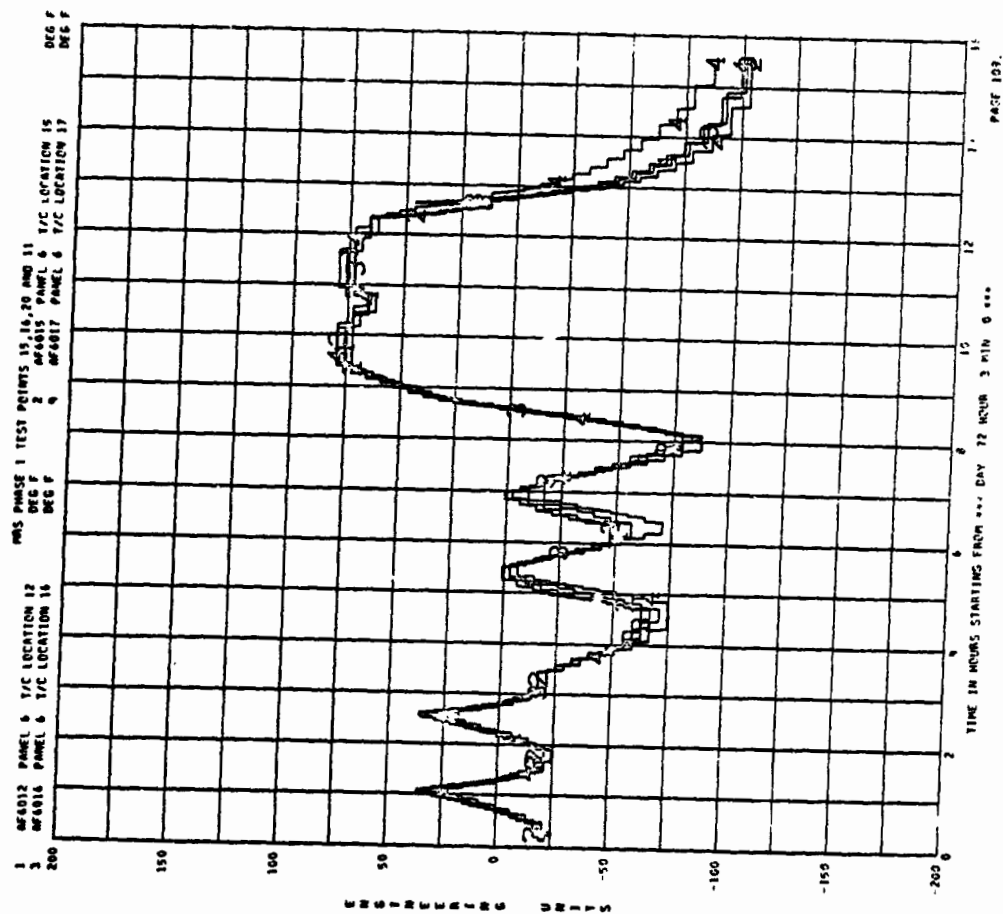


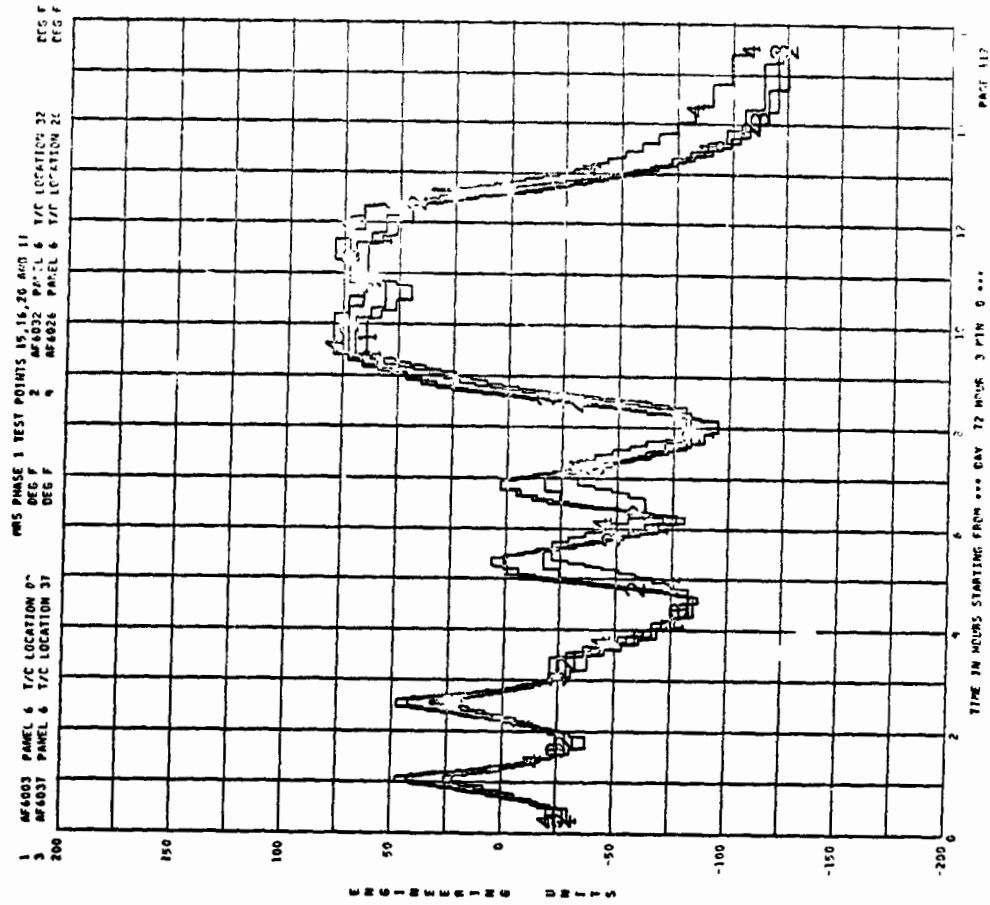
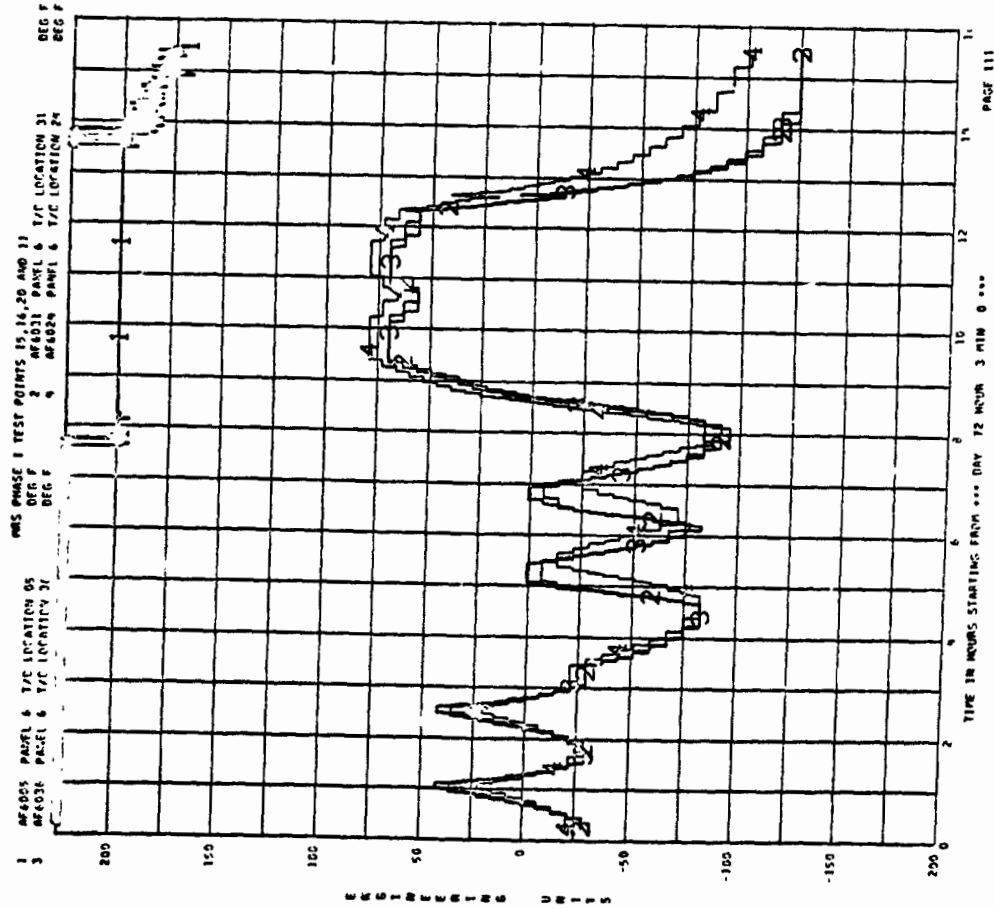


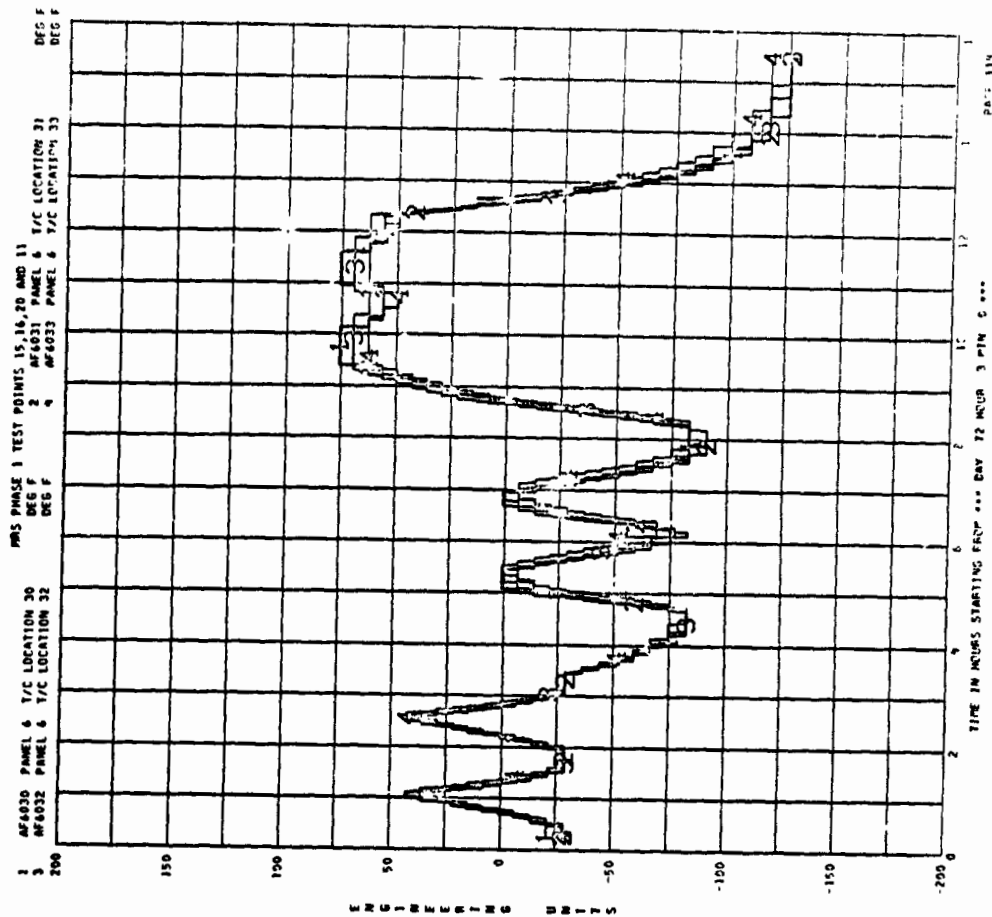
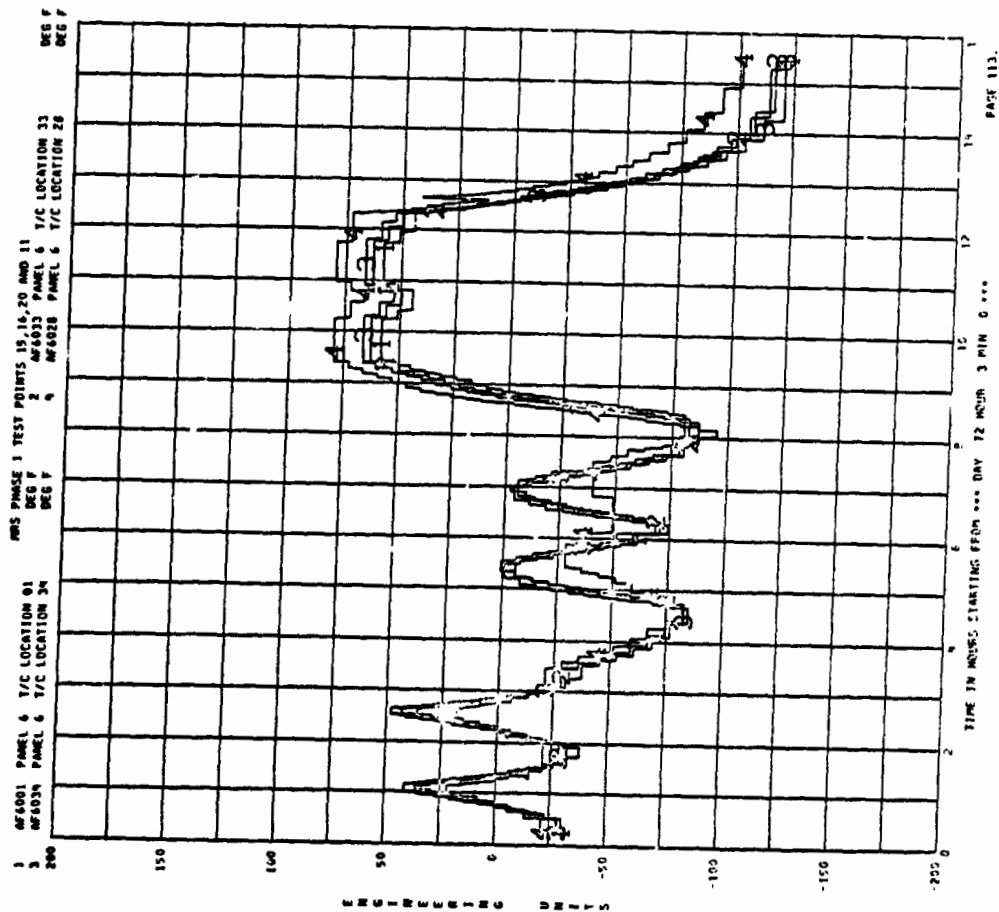


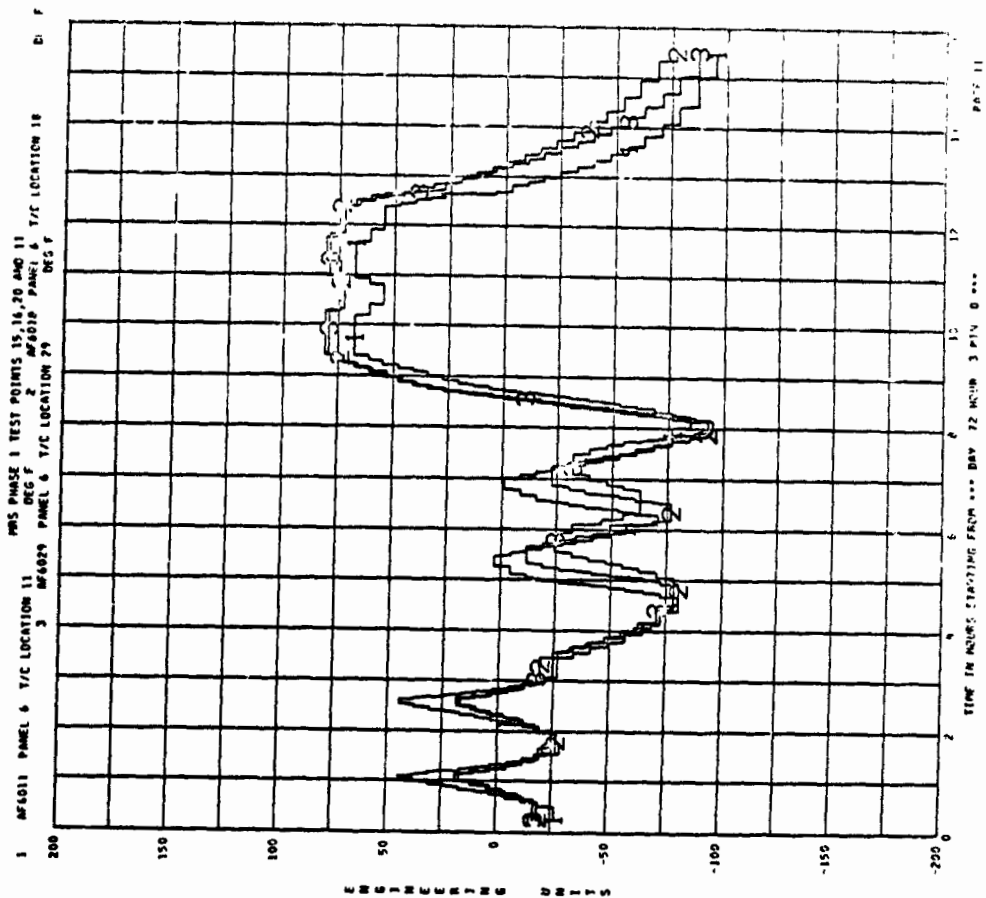
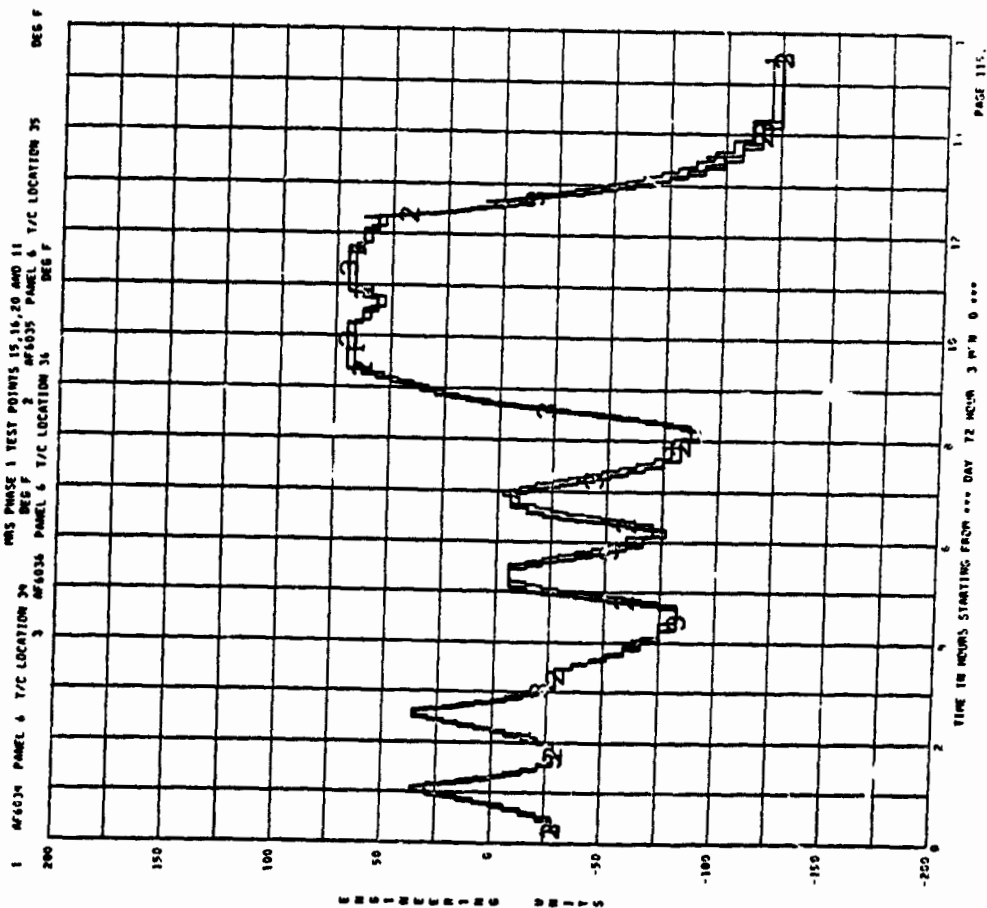


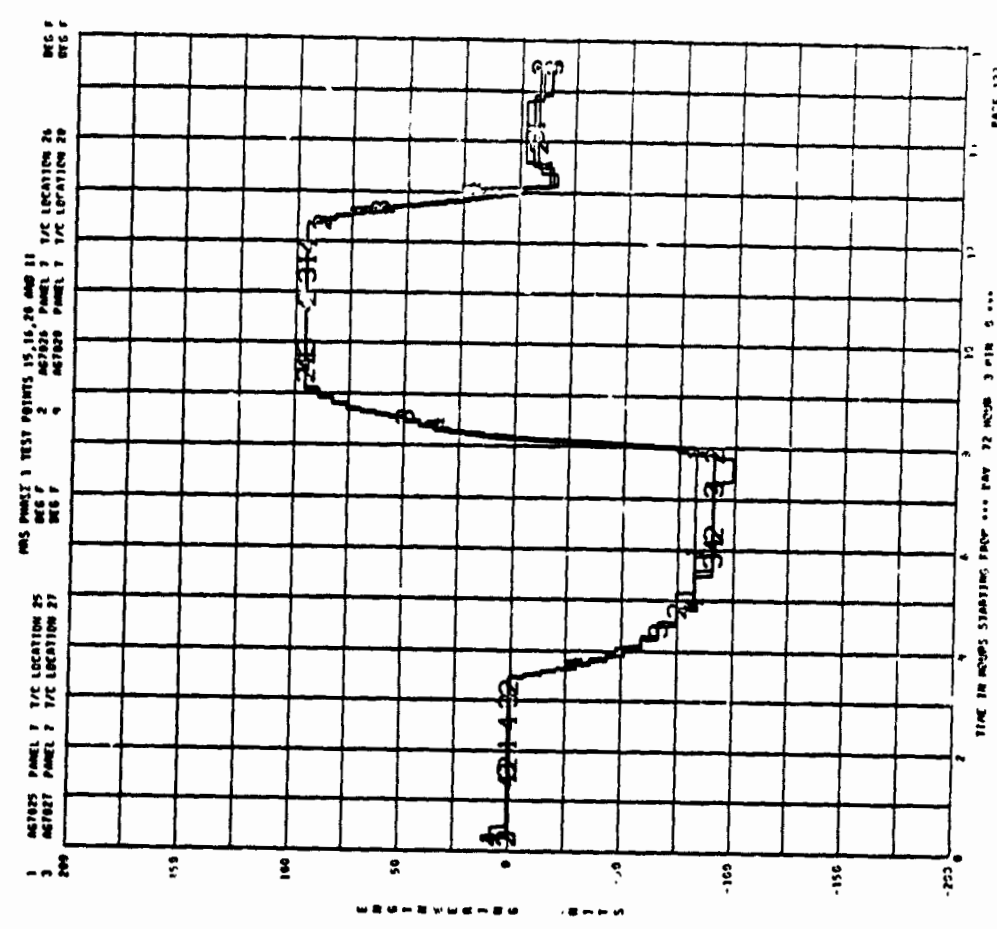
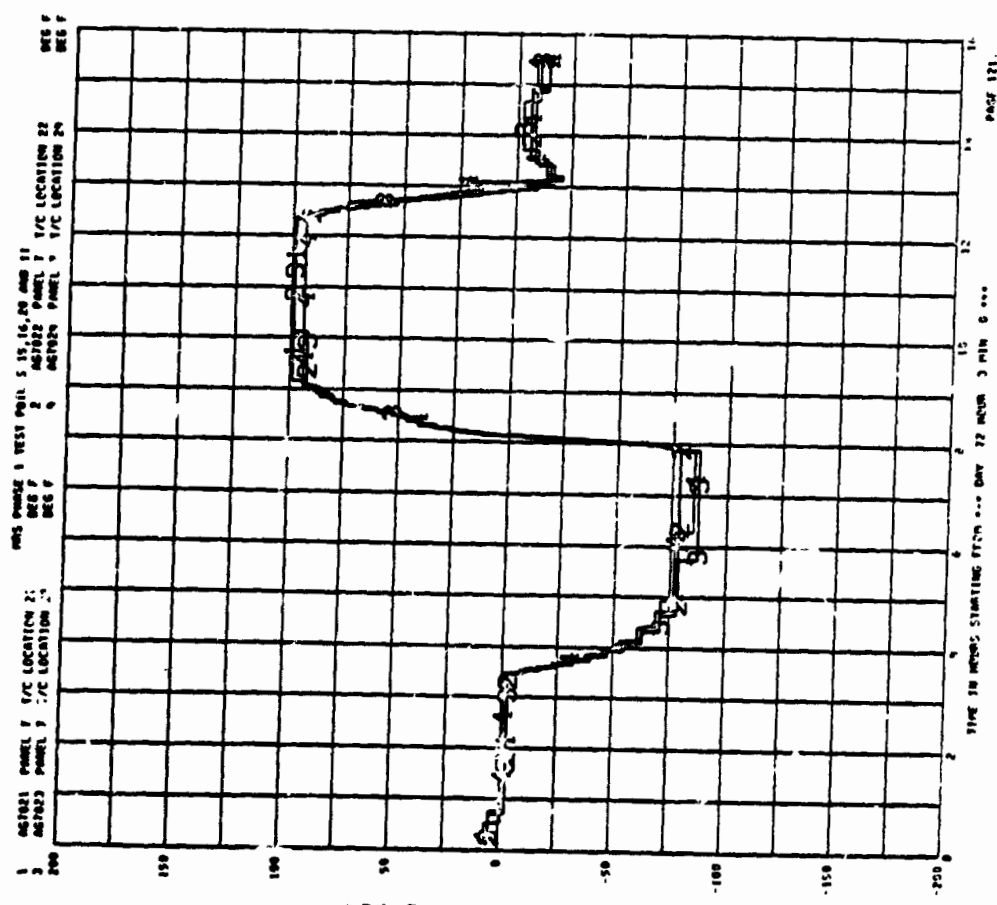


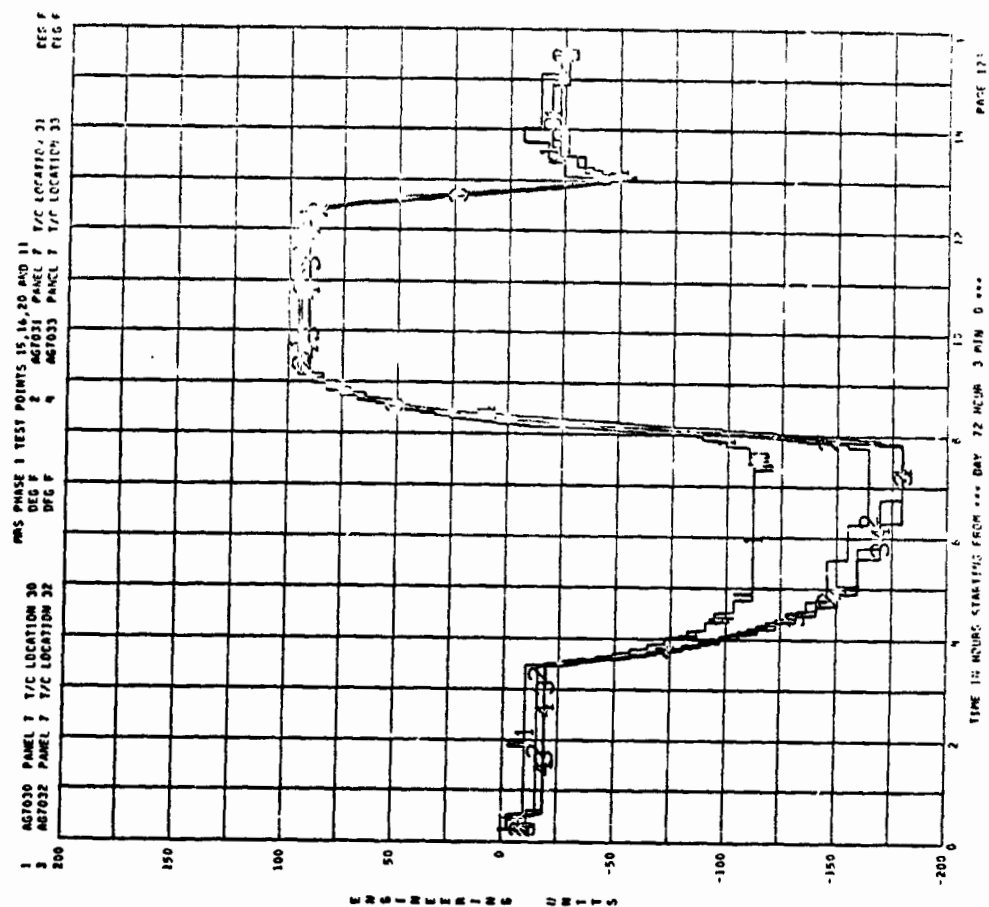
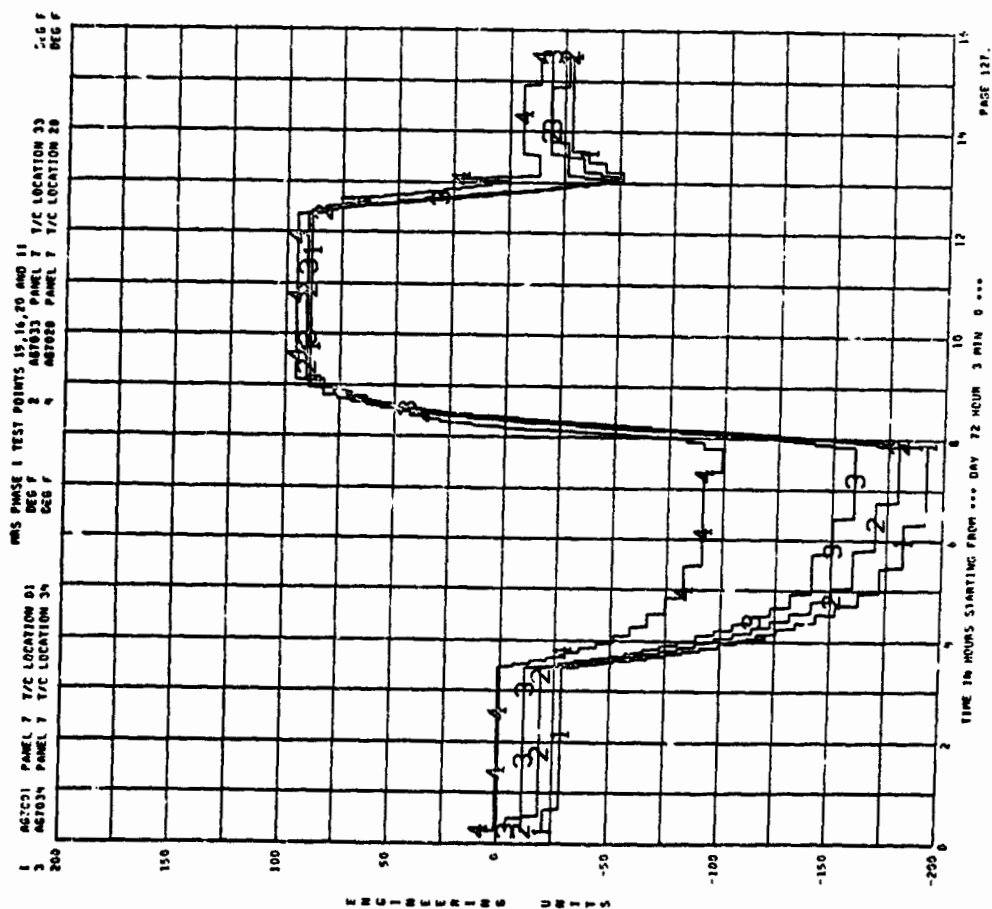


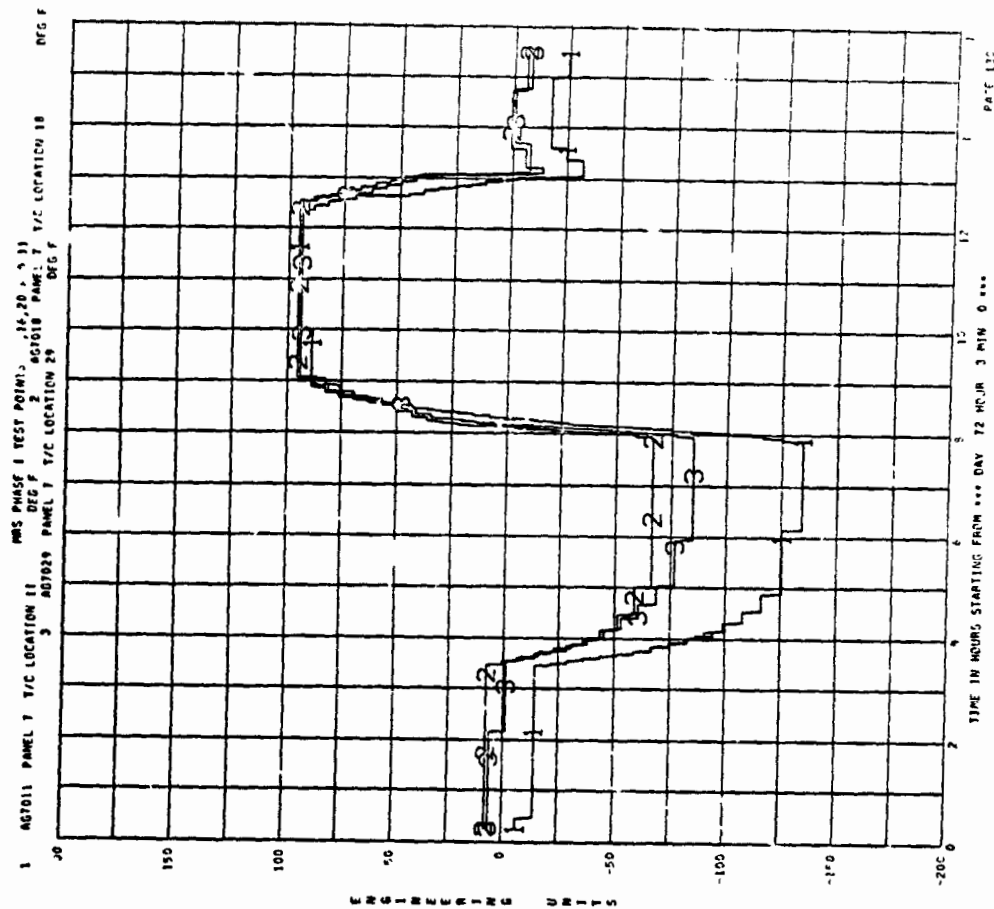
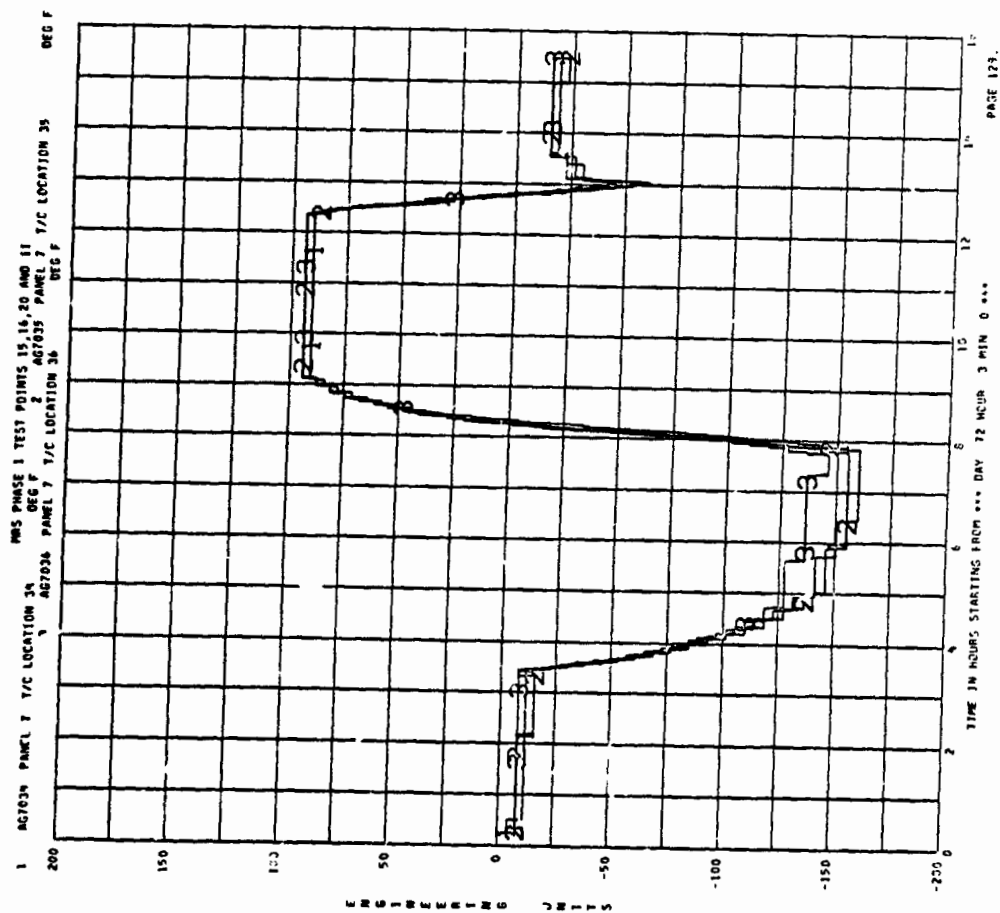


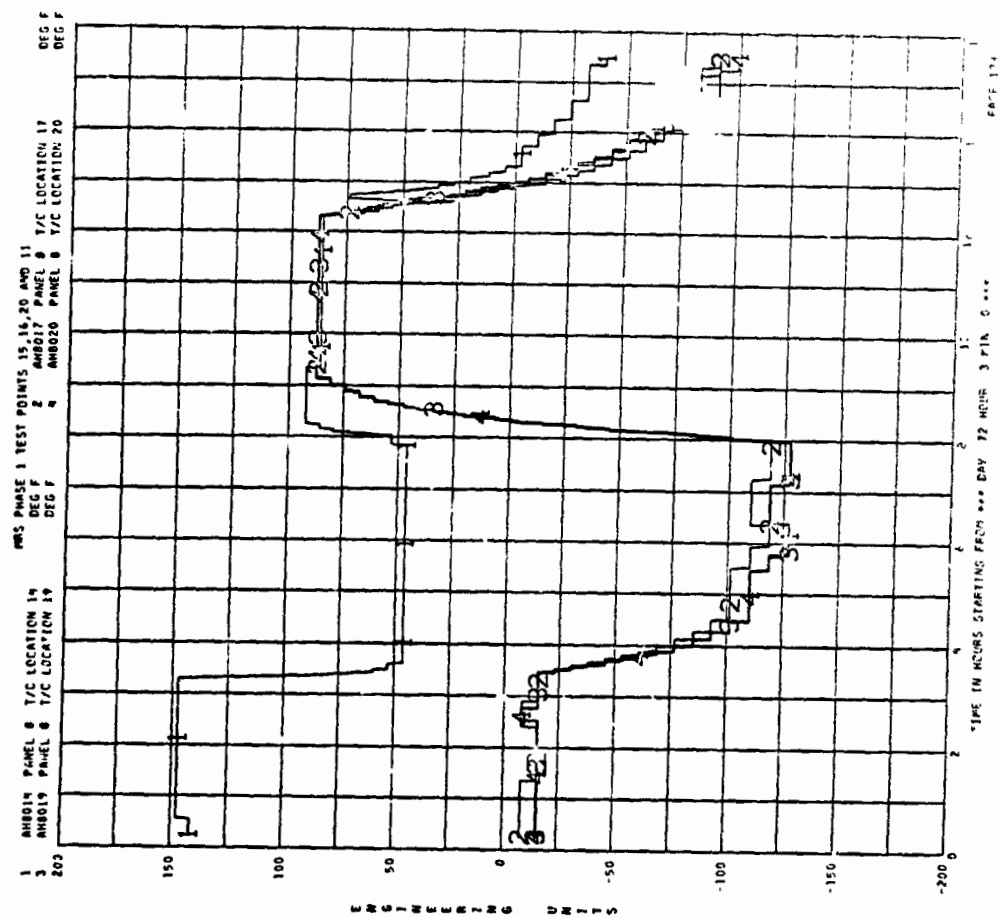
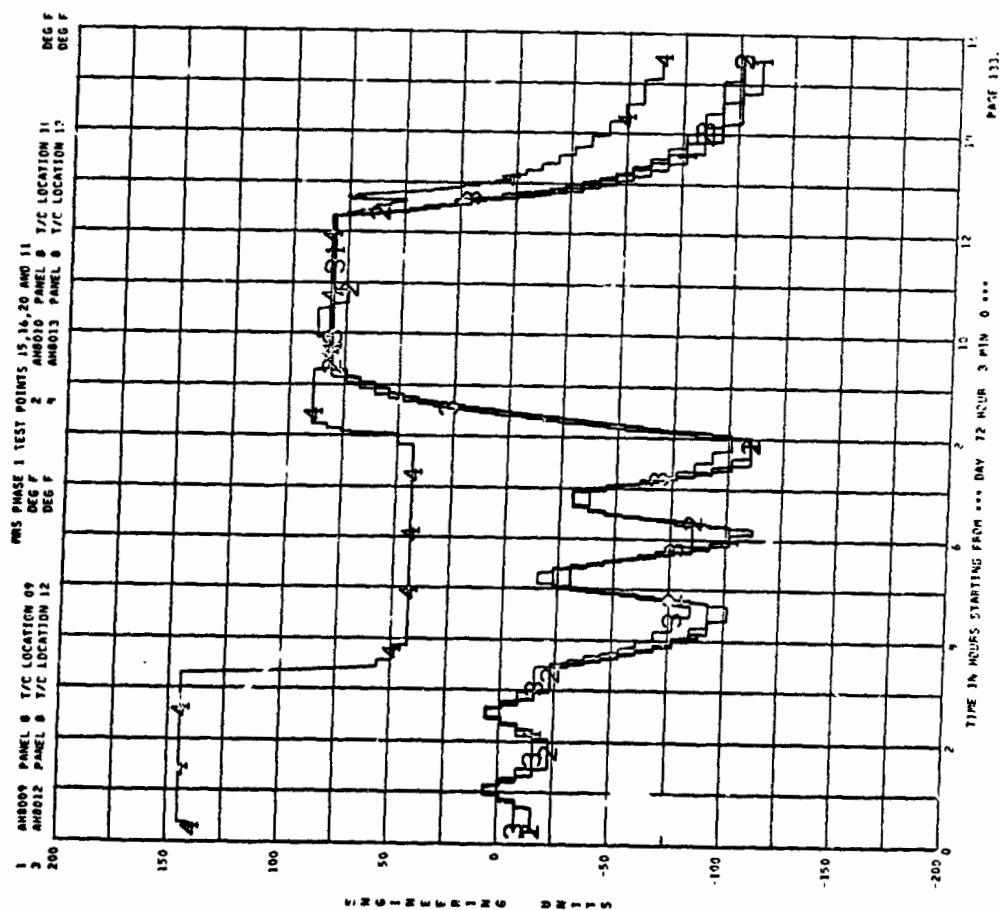


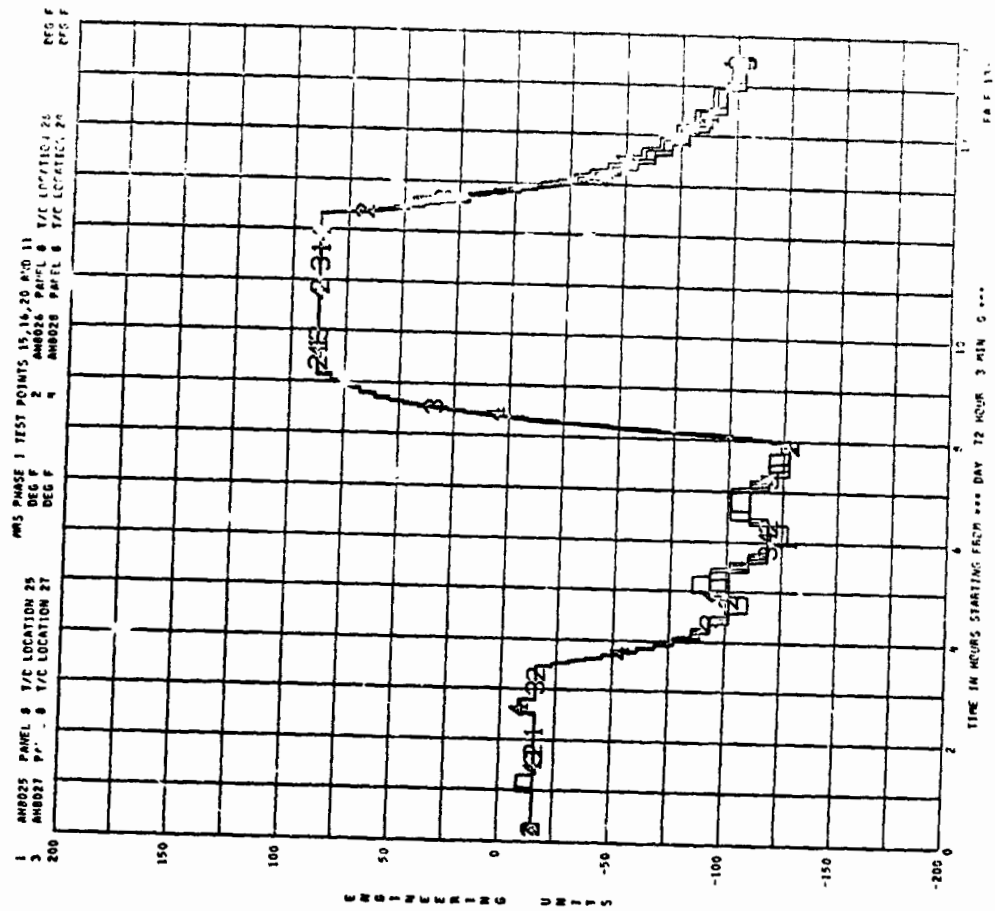
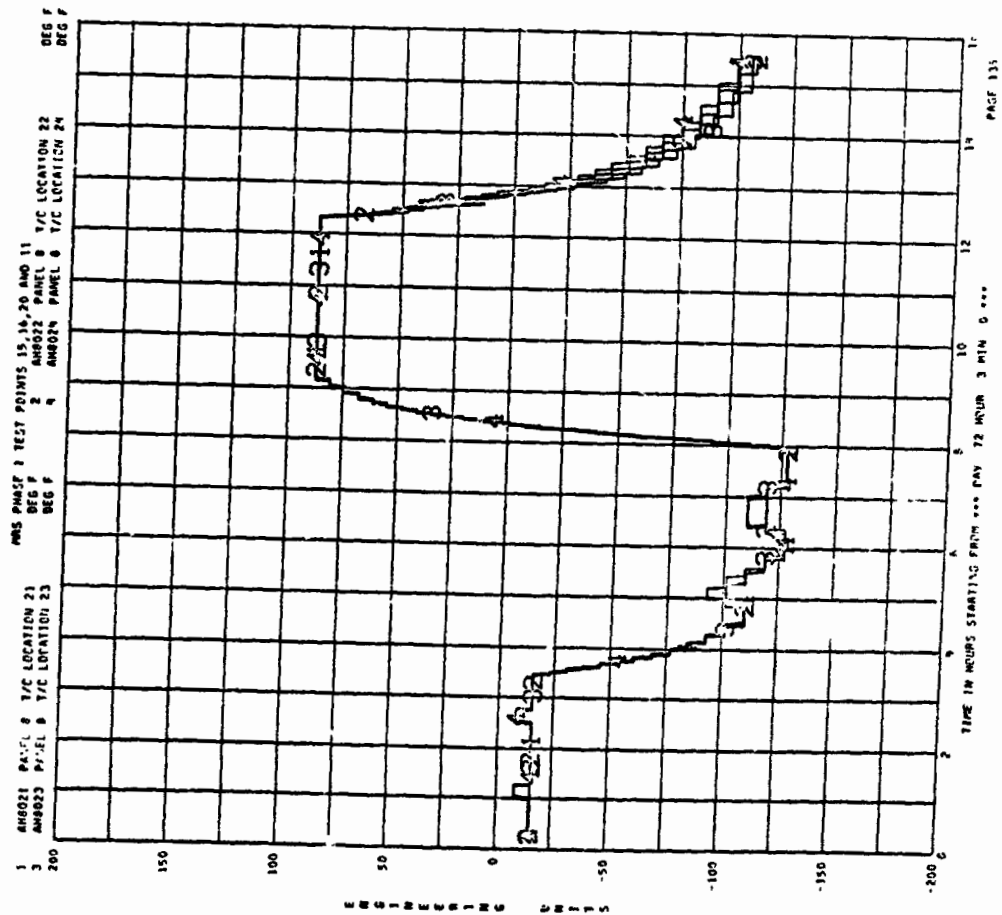


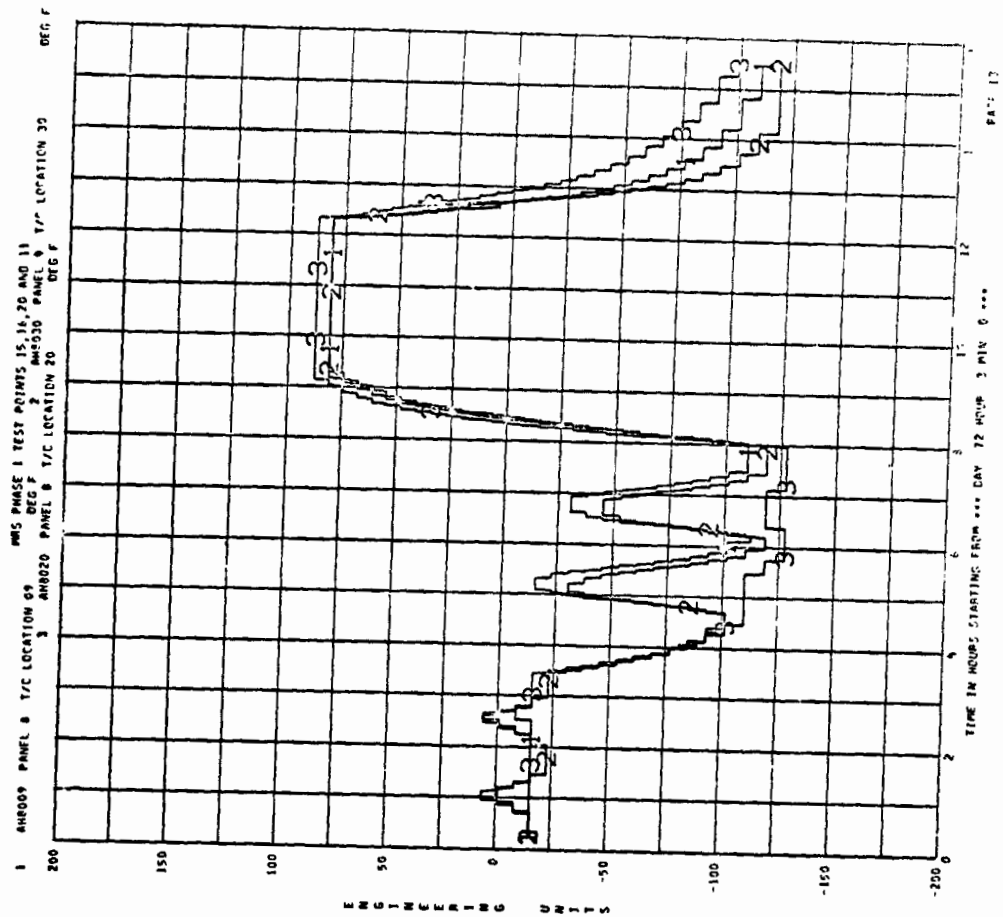
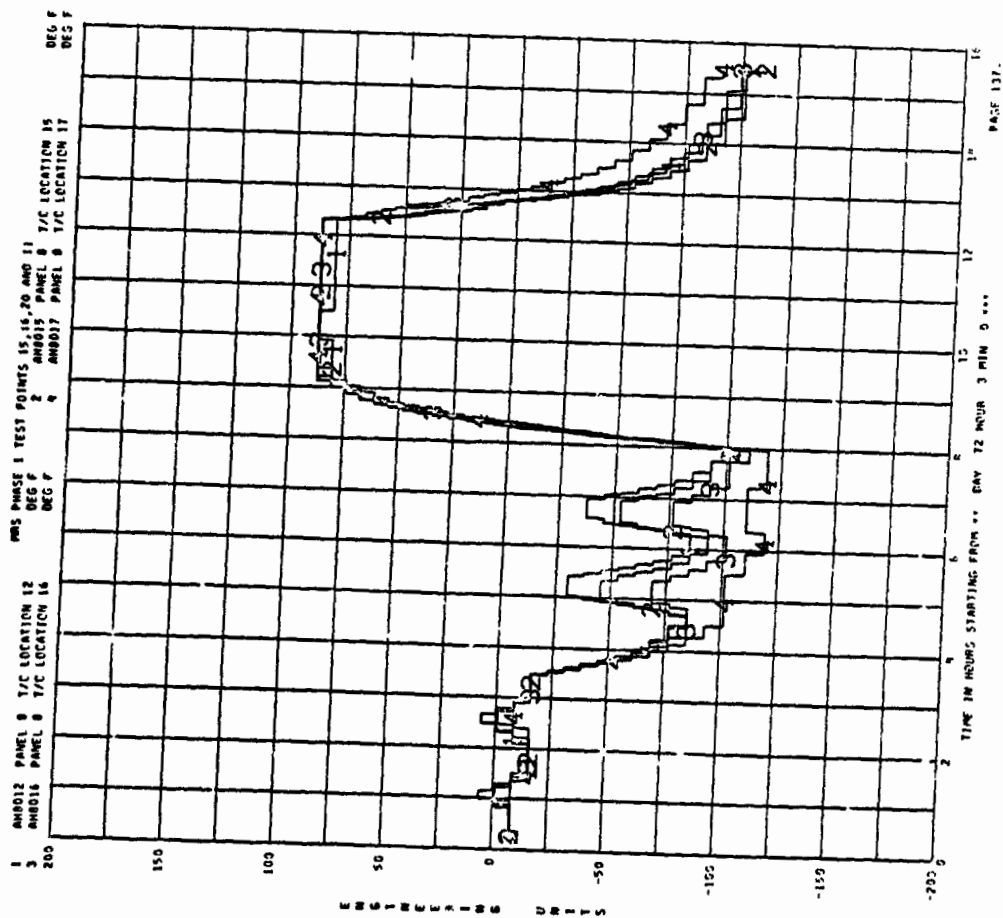


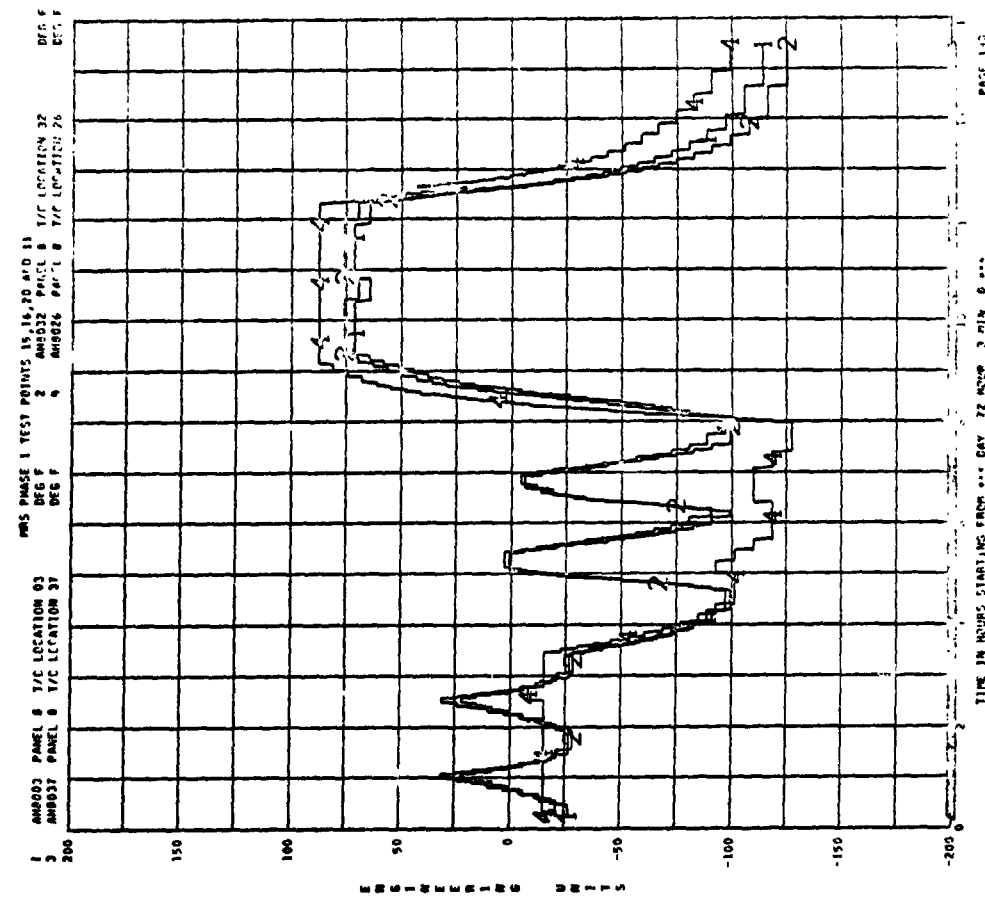
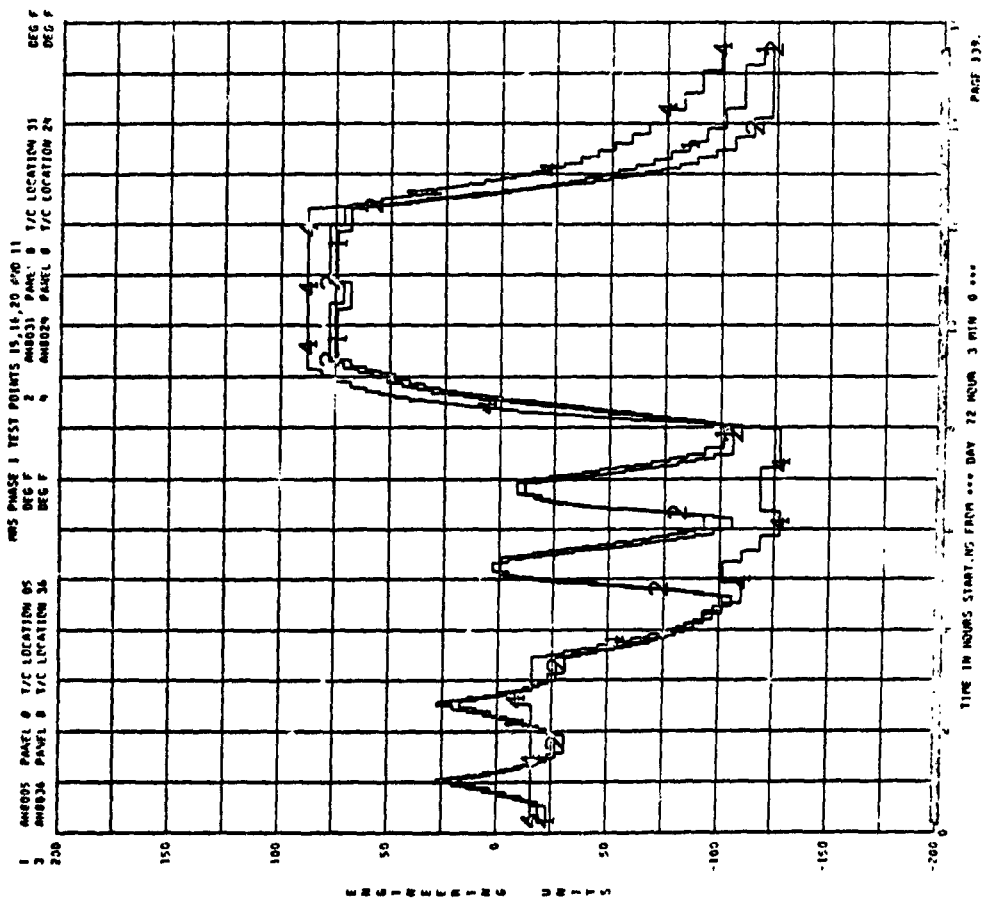


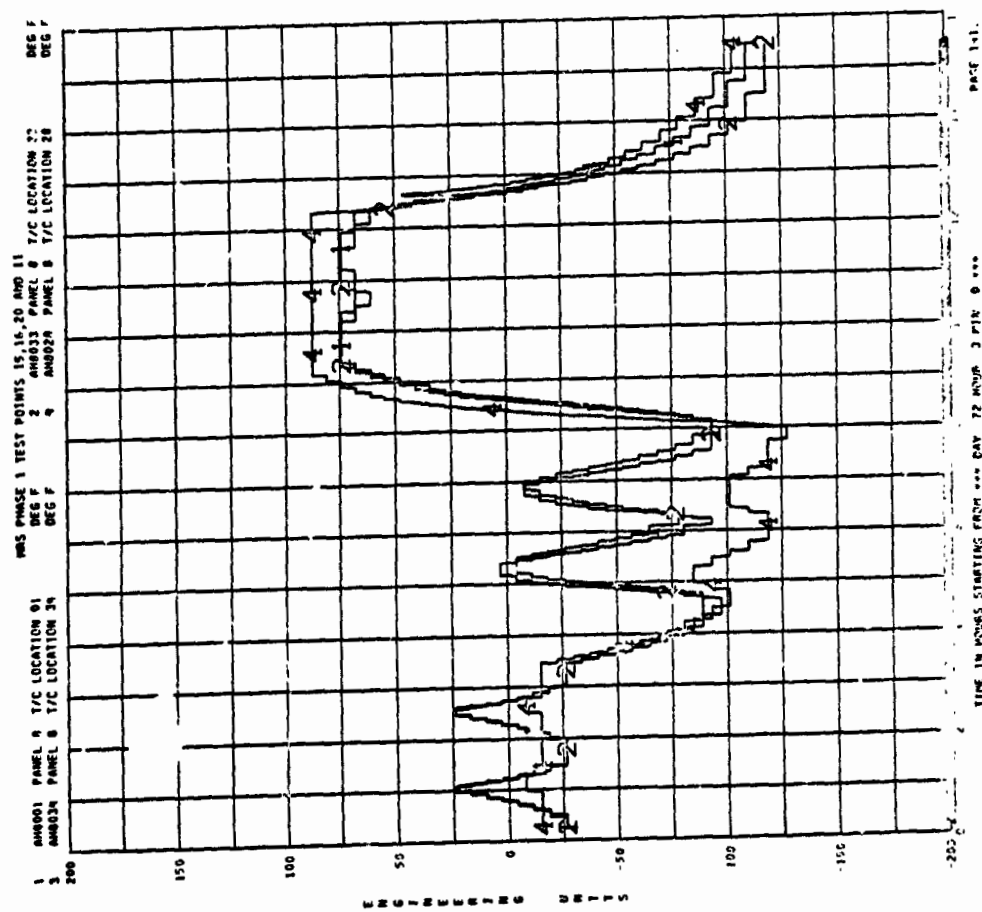
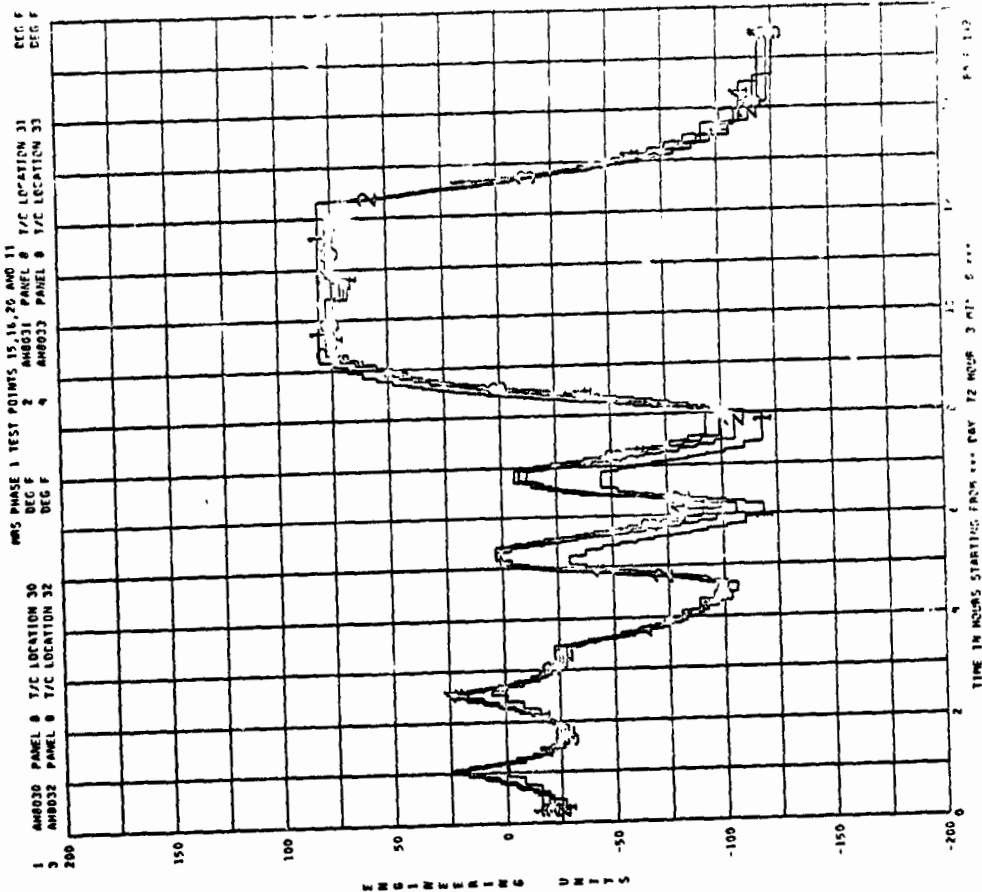










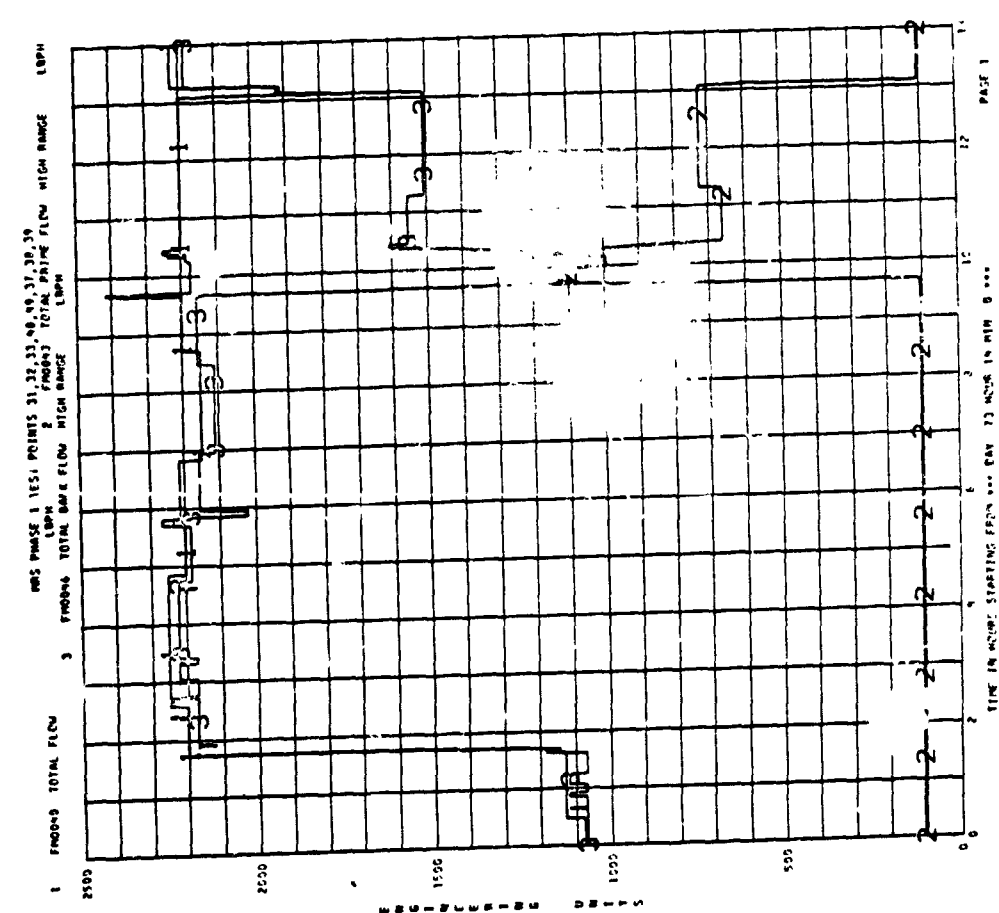
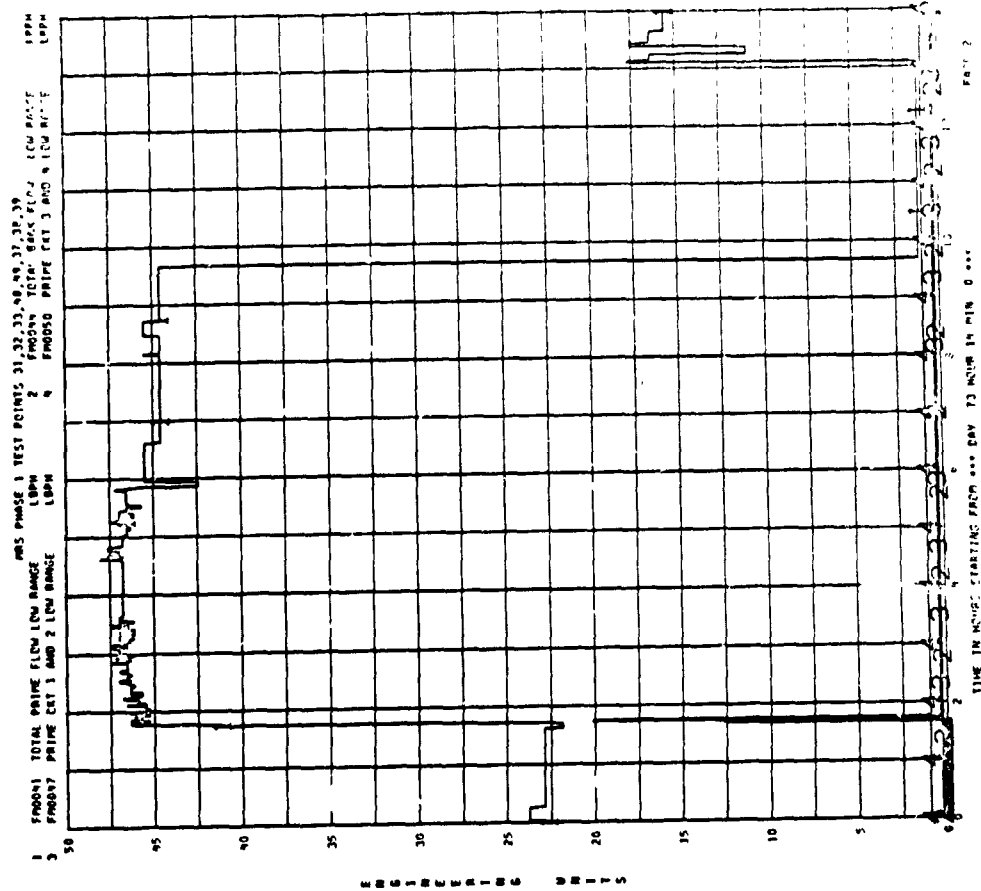


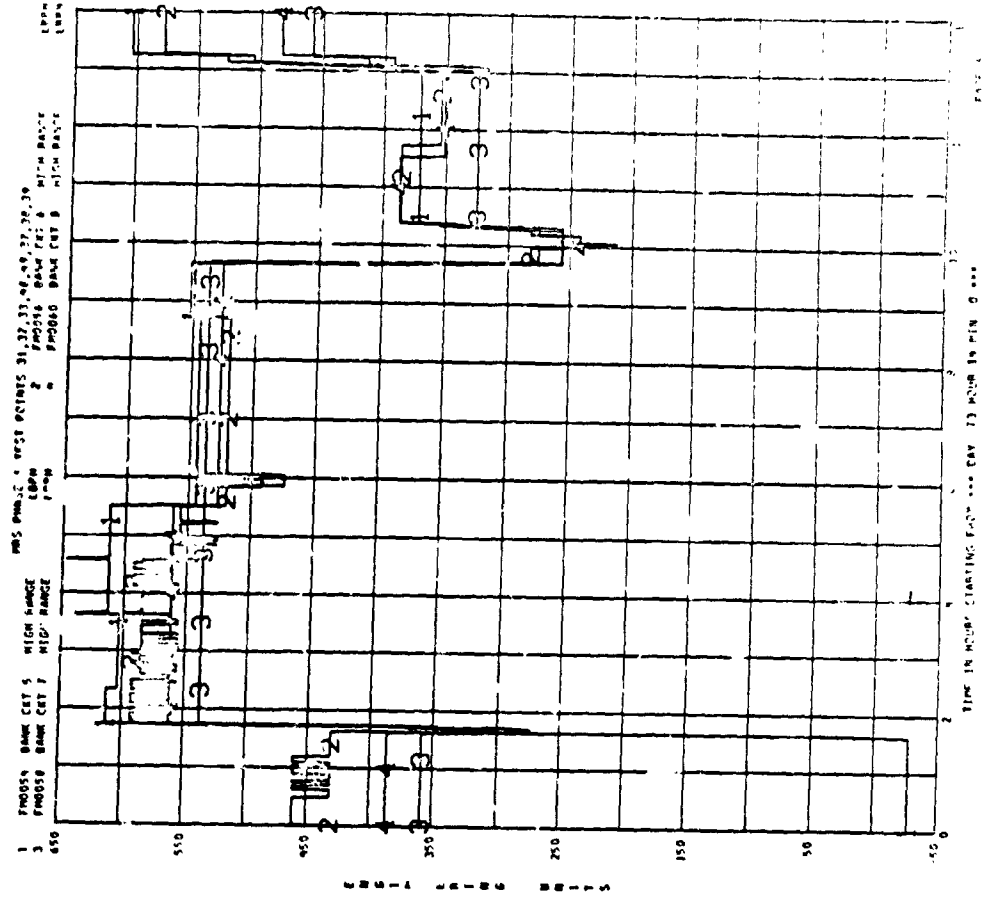
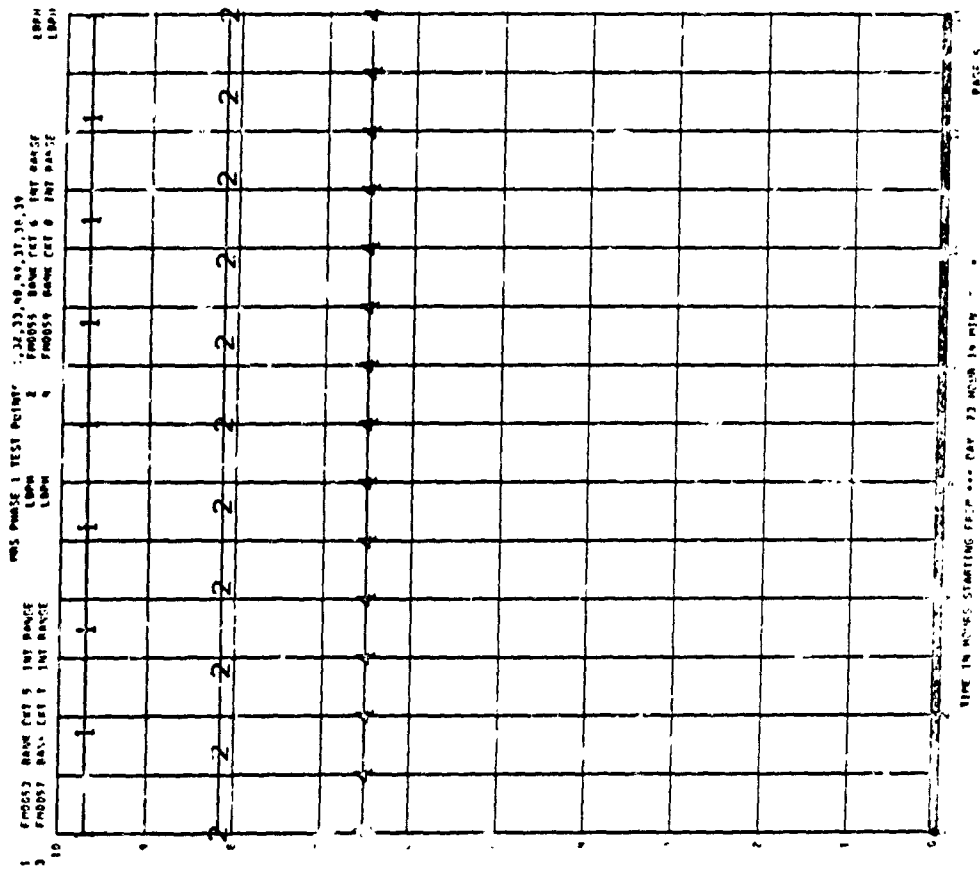
TEST GROUP F

73:14:00 - 74:04:00

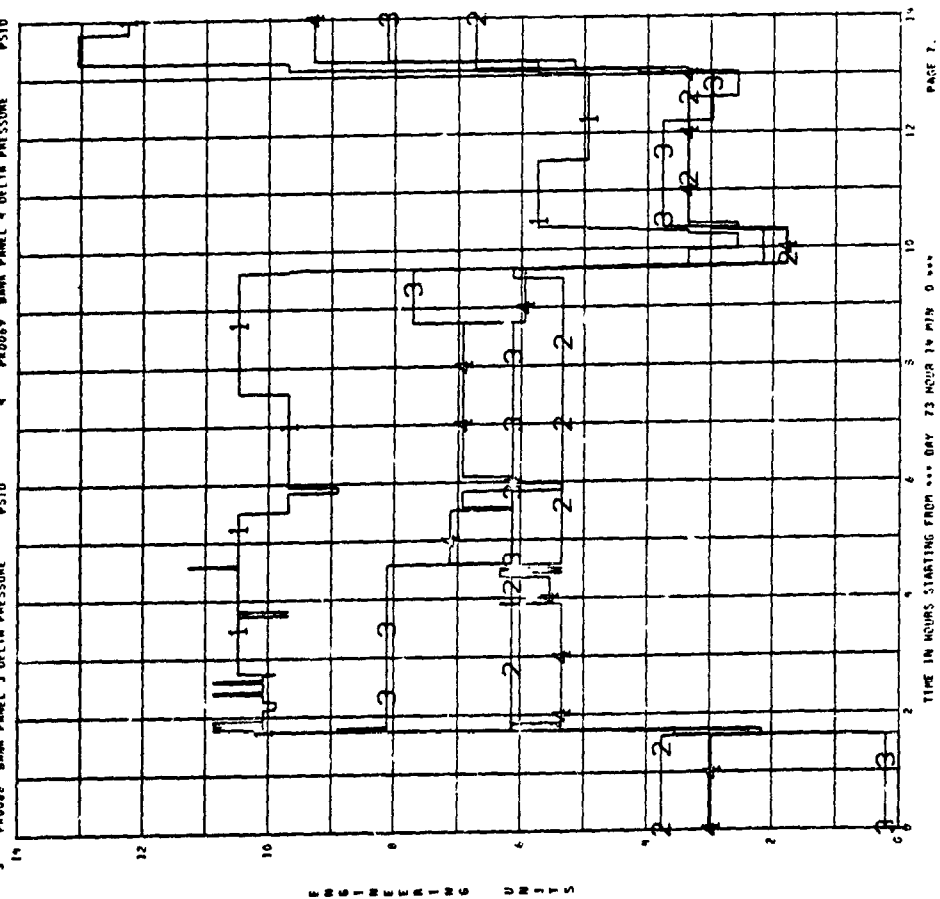
INCLUDES TEST POINTS

31
32
33
48
49
37
38
39



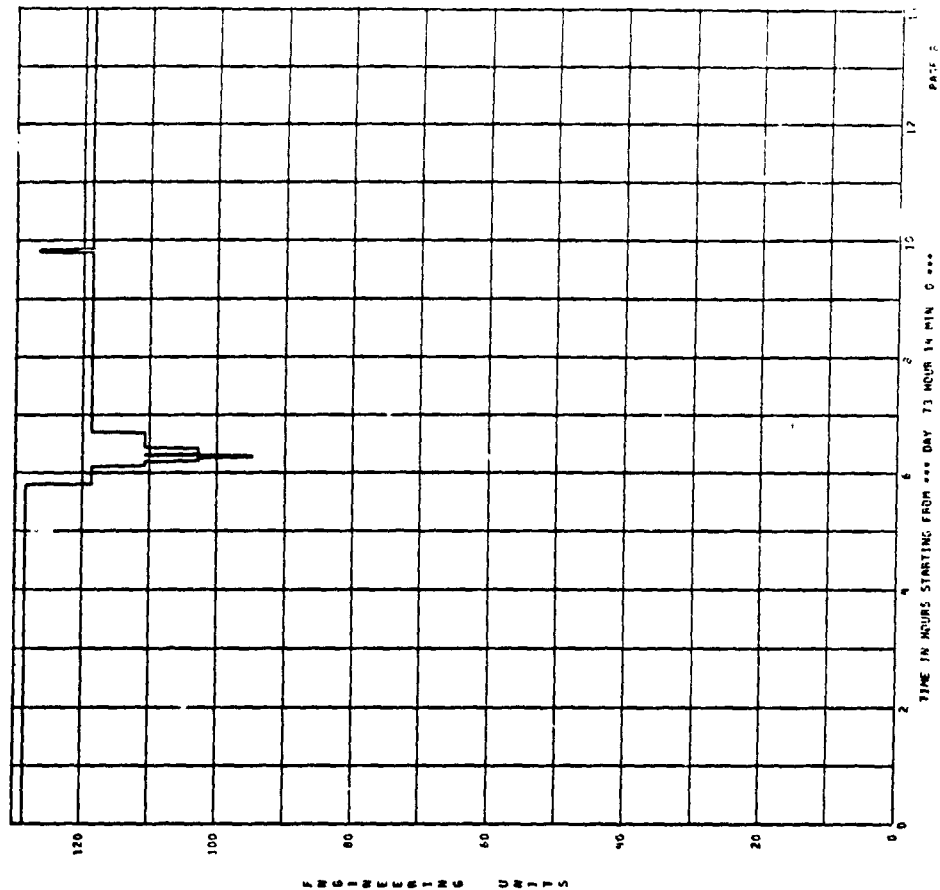


1 PRODA4 BANK PANEL 1 DELTA PRESSURE PSID
 2 PRODA7 BANK PANEL 2 DELTA PRESSURE PSID
 3 PRODA9 BANK PANEL 3 DELTA PRESSURE PSID
 4 PRODA9 BANK PANEL 4 DELTA PRESSURE PSID

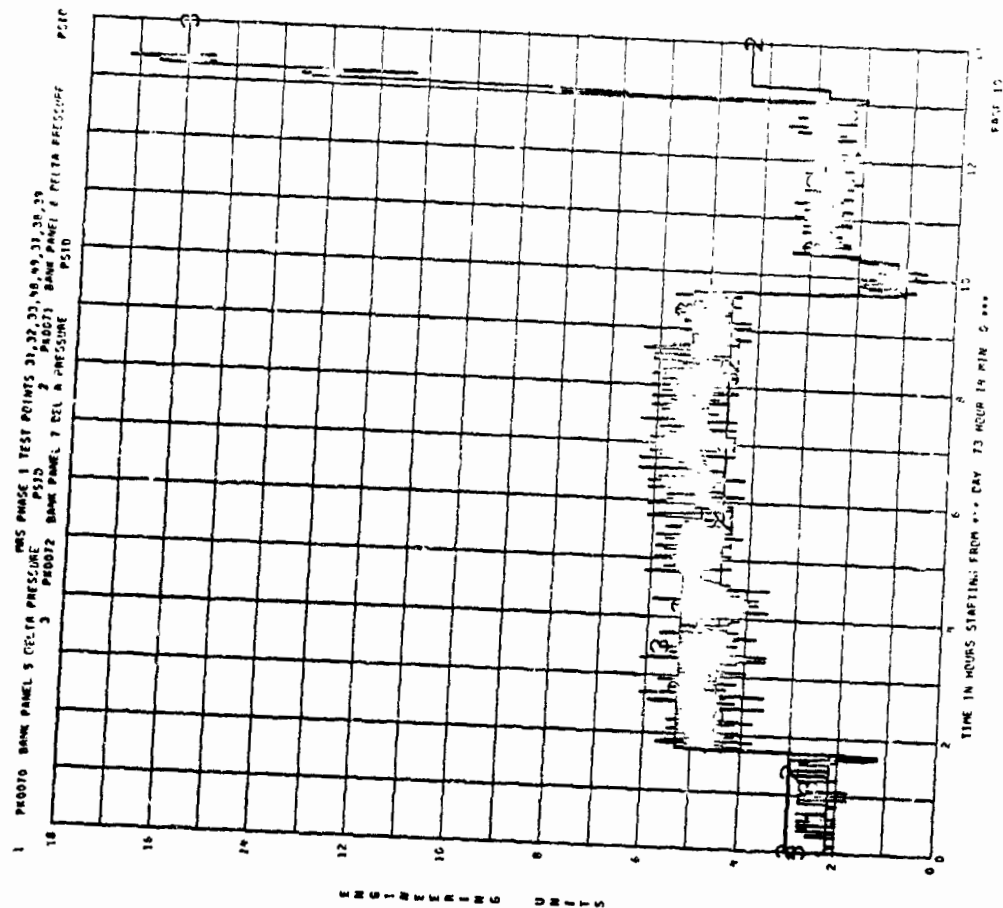
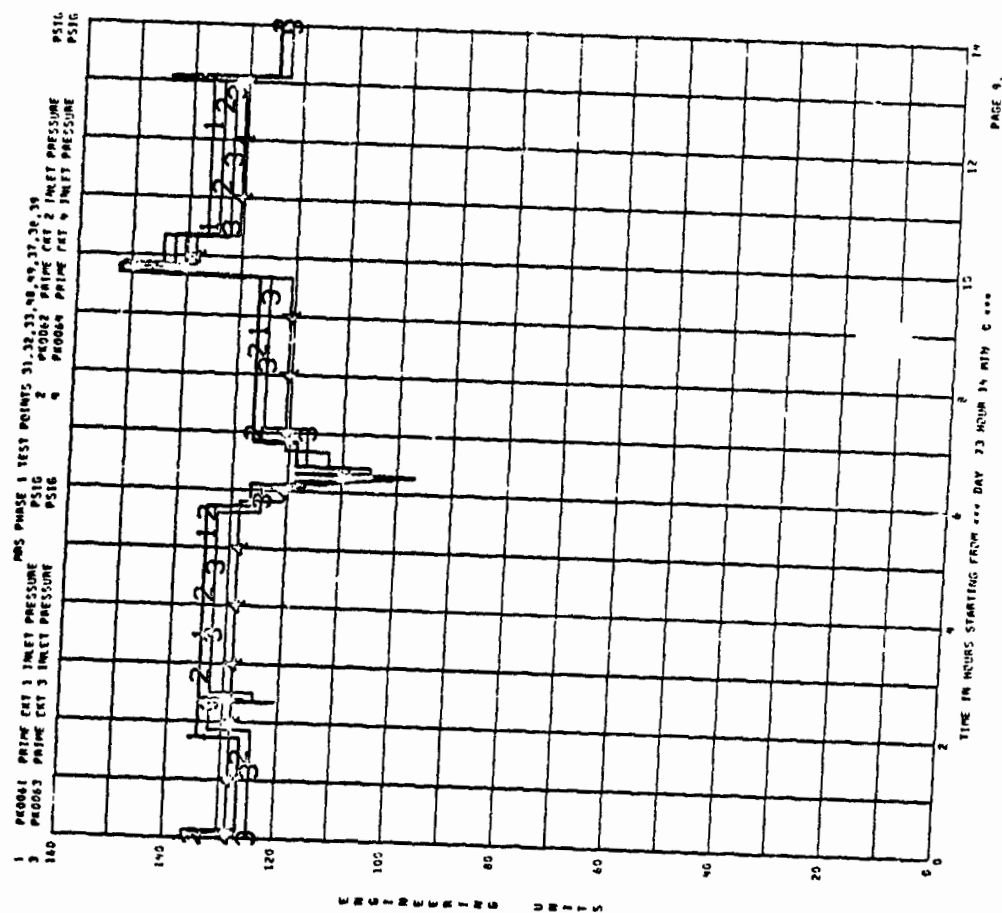


PAGE 7.

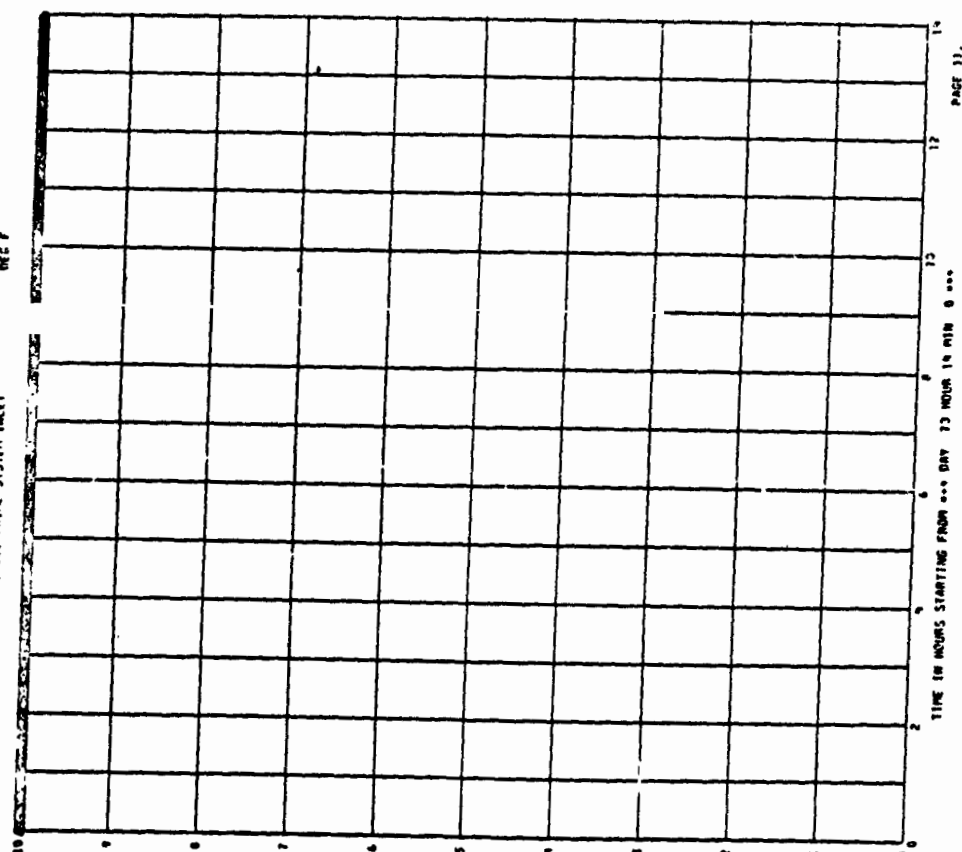
1 PRODA5 PRIME TUBE MIX CUILET PRESSURE PSIG
 2 PRODA5 PRIME TUBE MIX CUILET PRESSURE PSIG



PAGE 8

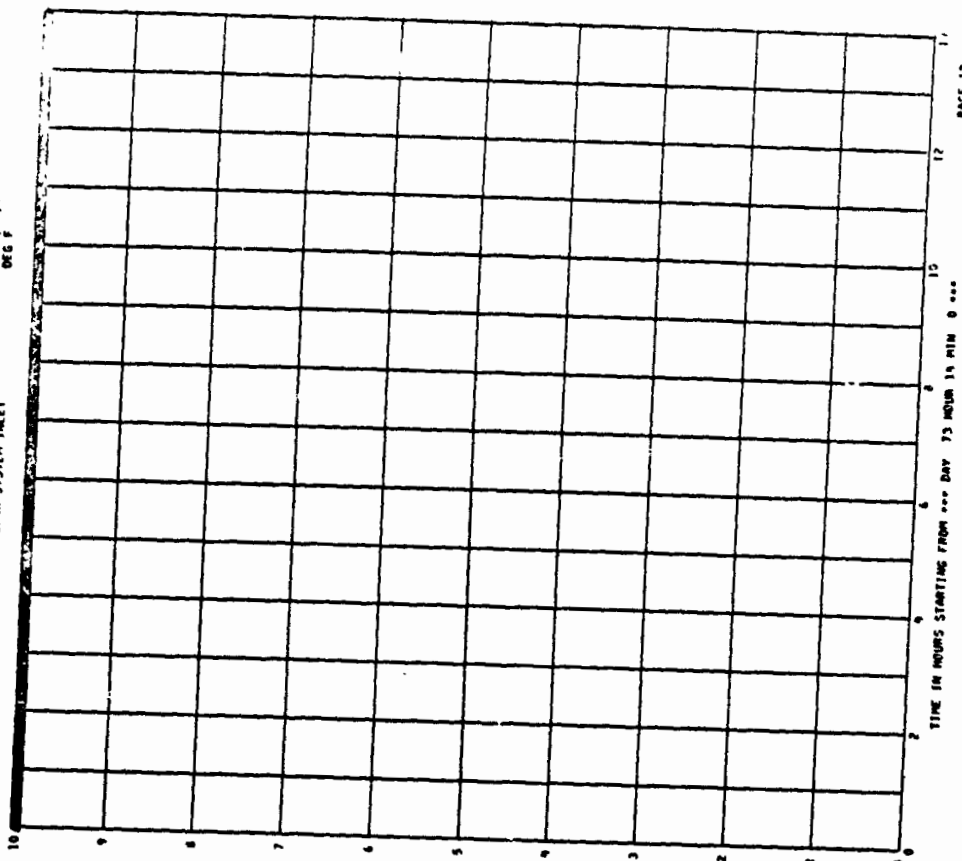


1 A10001 PHASE 1 TEST POINTS 31,32,33,40,49,37,36,39
DEG F



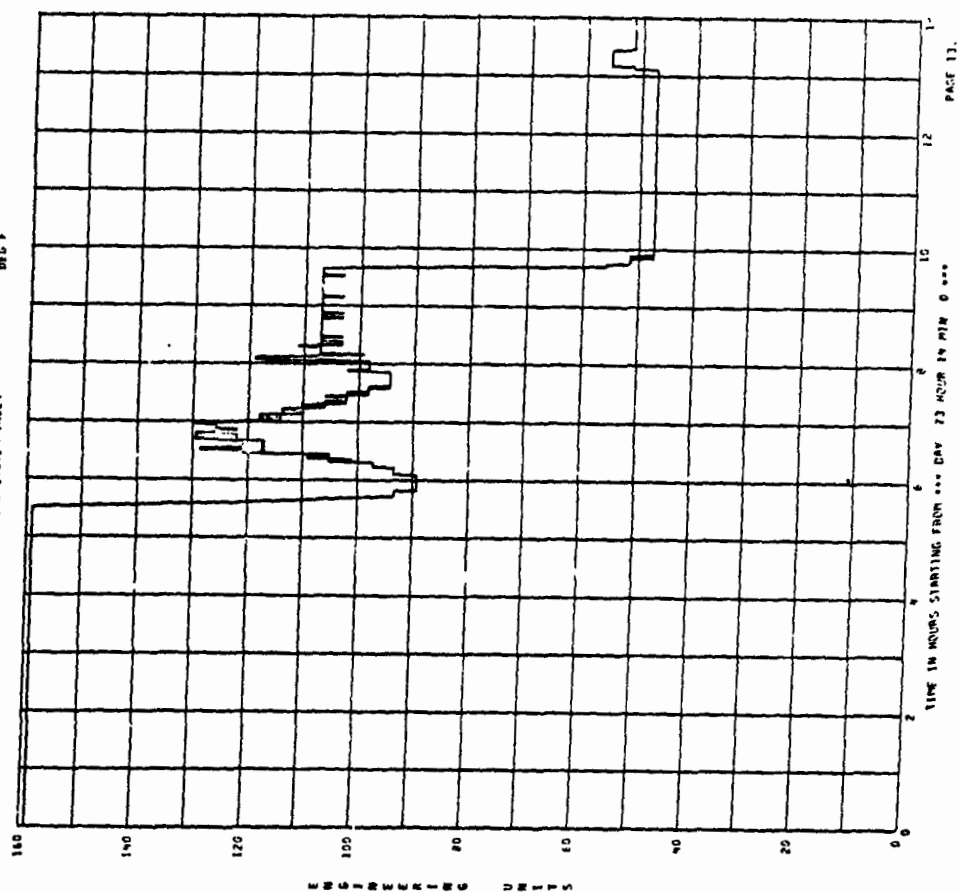
TIME IN HOURS STARTING FROM ... DAY 73 HOUR 14 MIN 0 ...

1 A10002 PHASE 1 TEST POINTS 31,32,33,40,49,37,36,39
DEG F

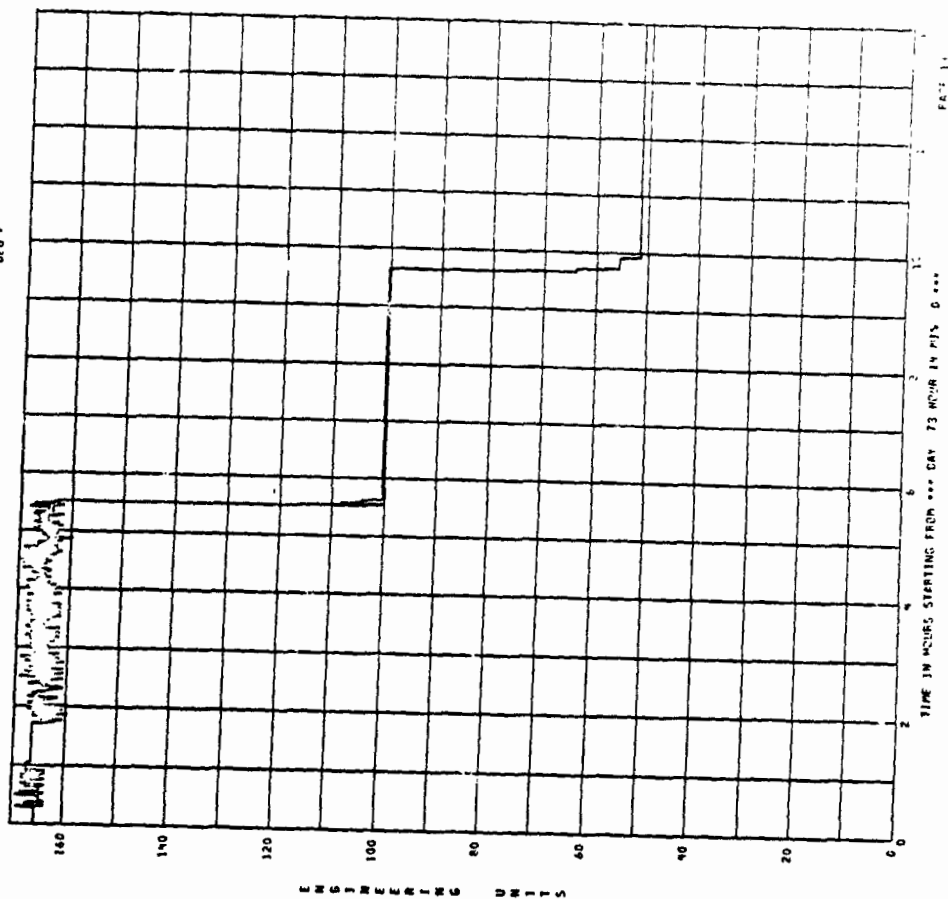


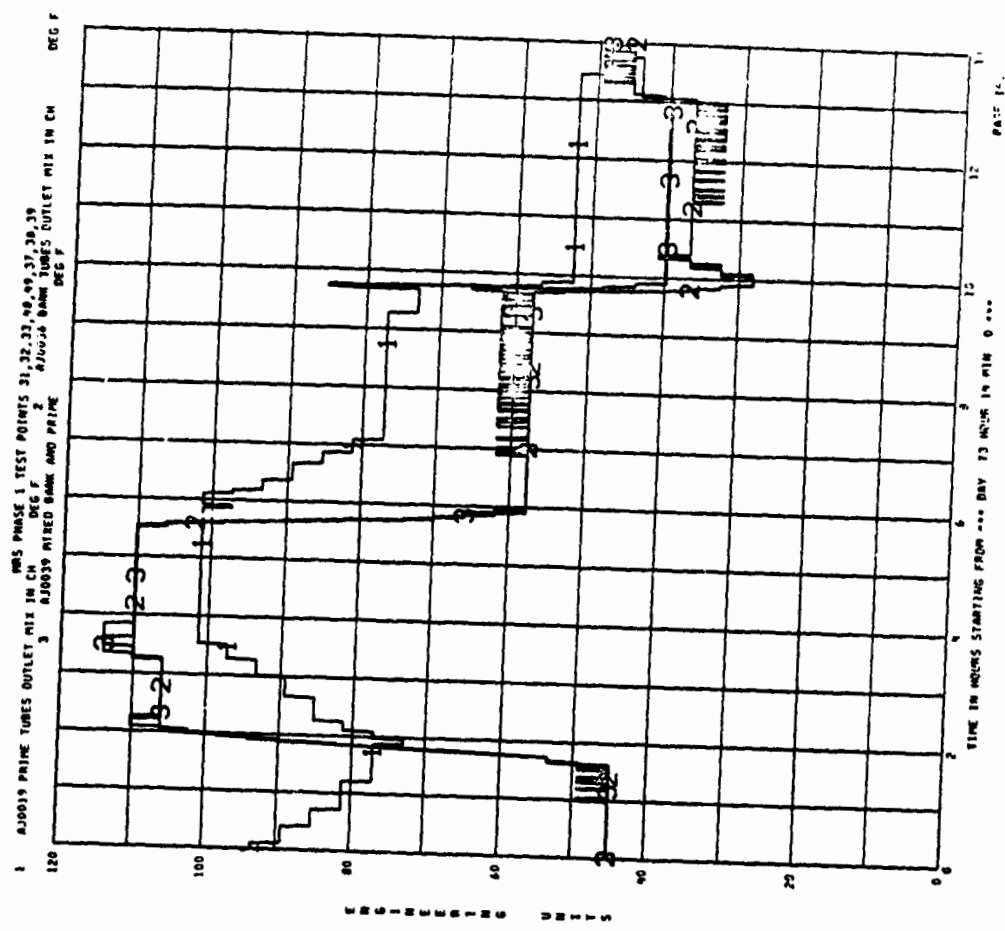
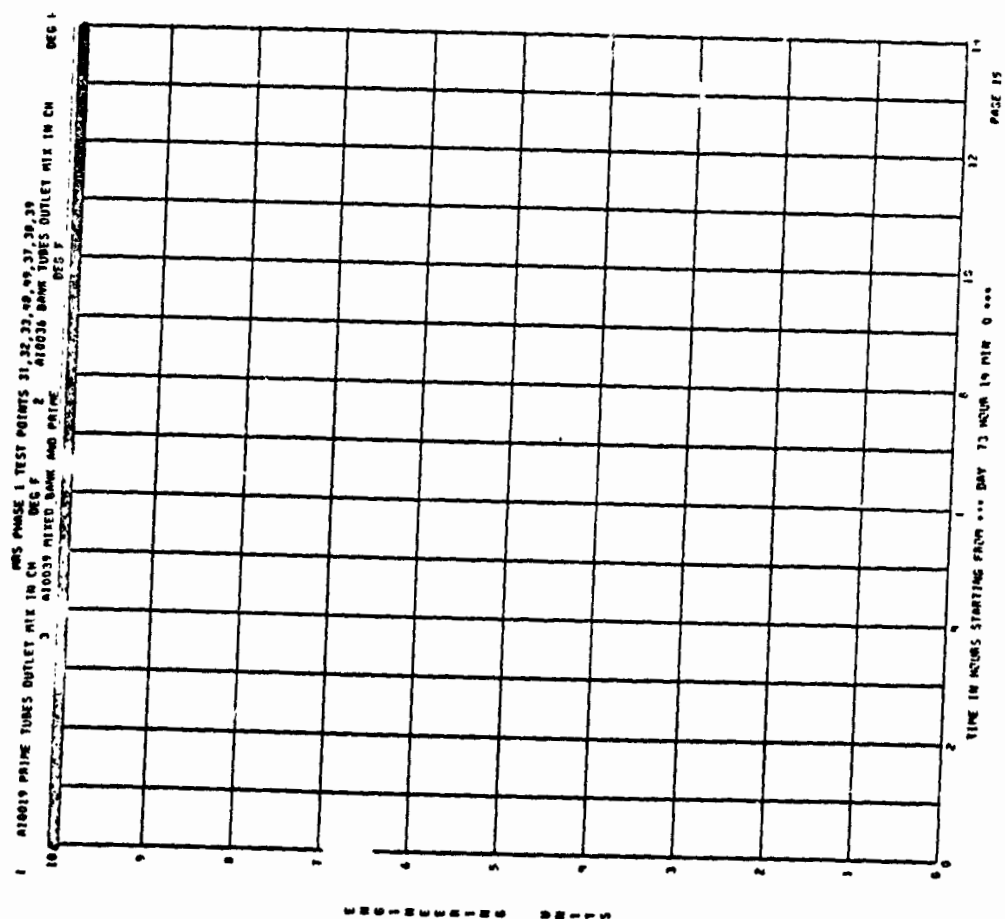
TIME IN HOURS STARTING FROM ... DAY 73 HOUR 14 MIN 0 ...

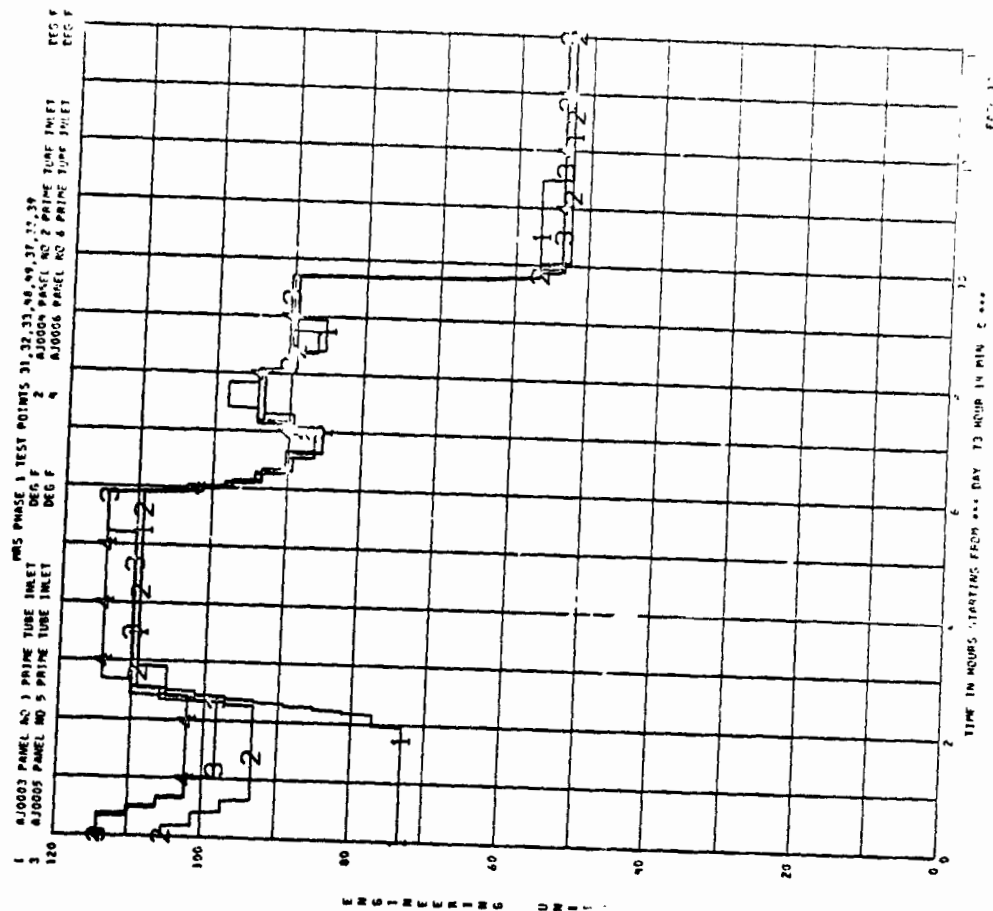
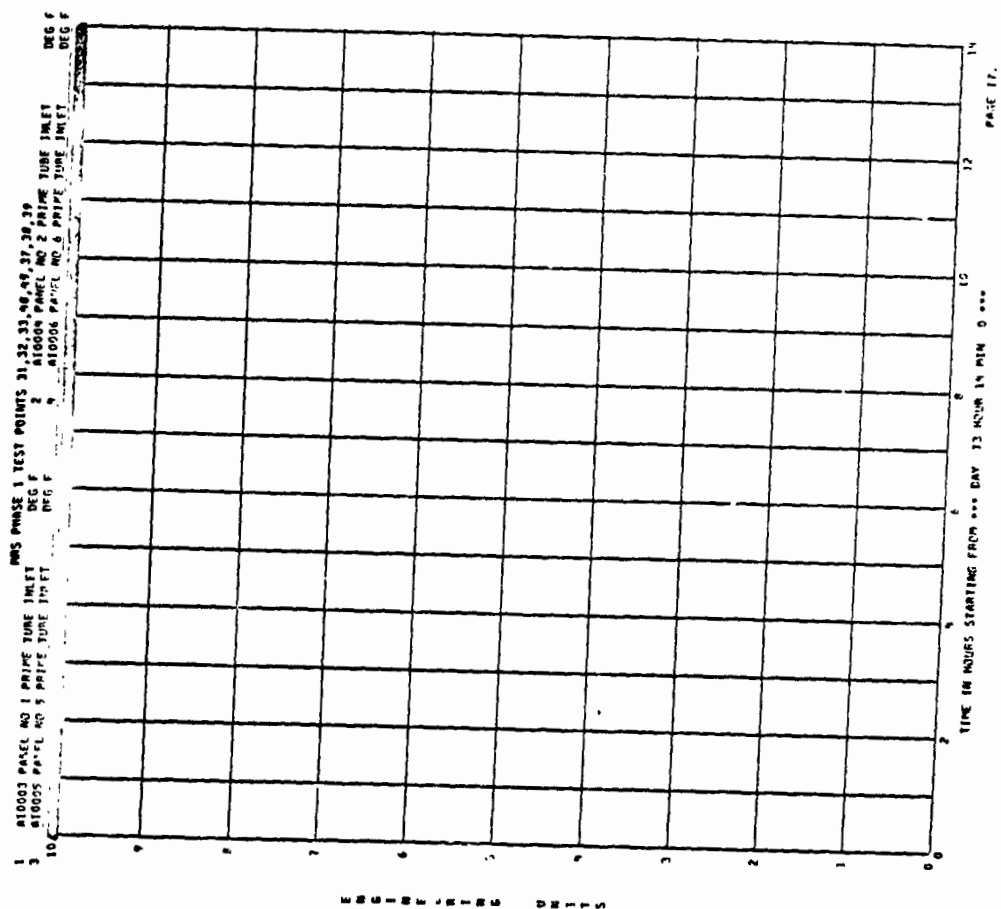
WMS PHASE 1 TEST POINTS 21, 32, 33, 49, 49, 37, 38, 39
 : AJ0001 PRIME SYSTEM INLET
 DEG F

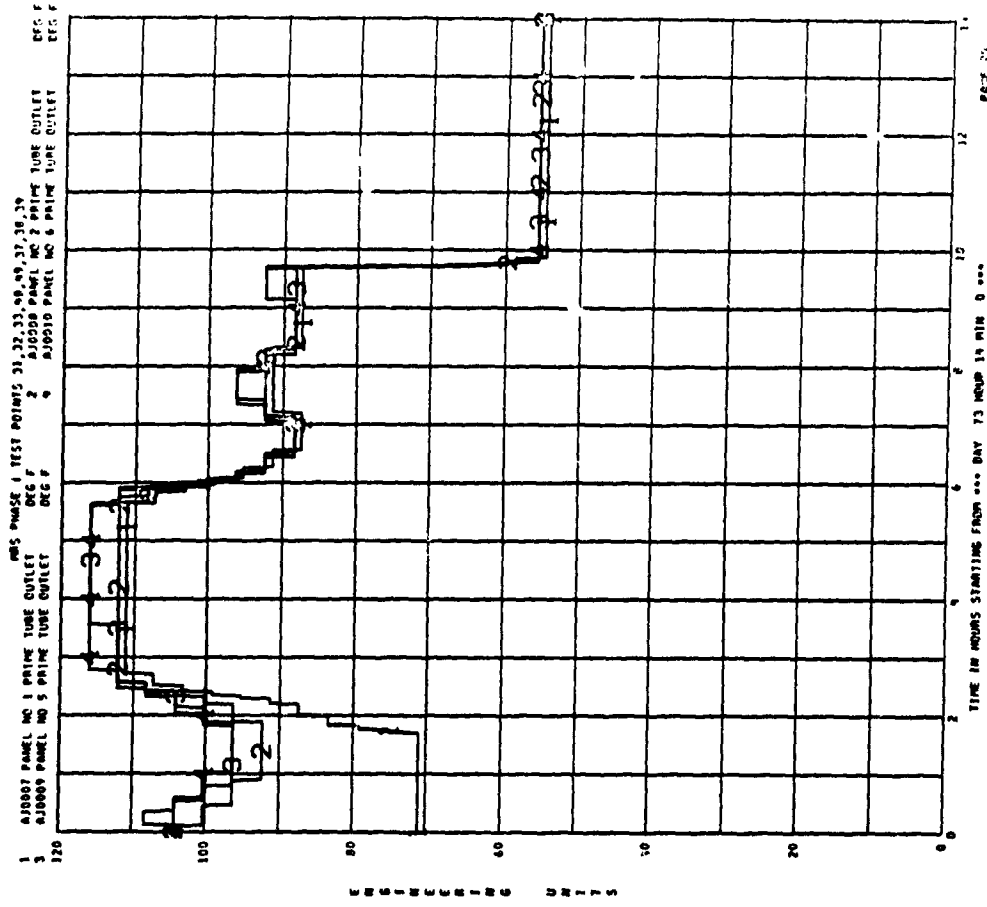
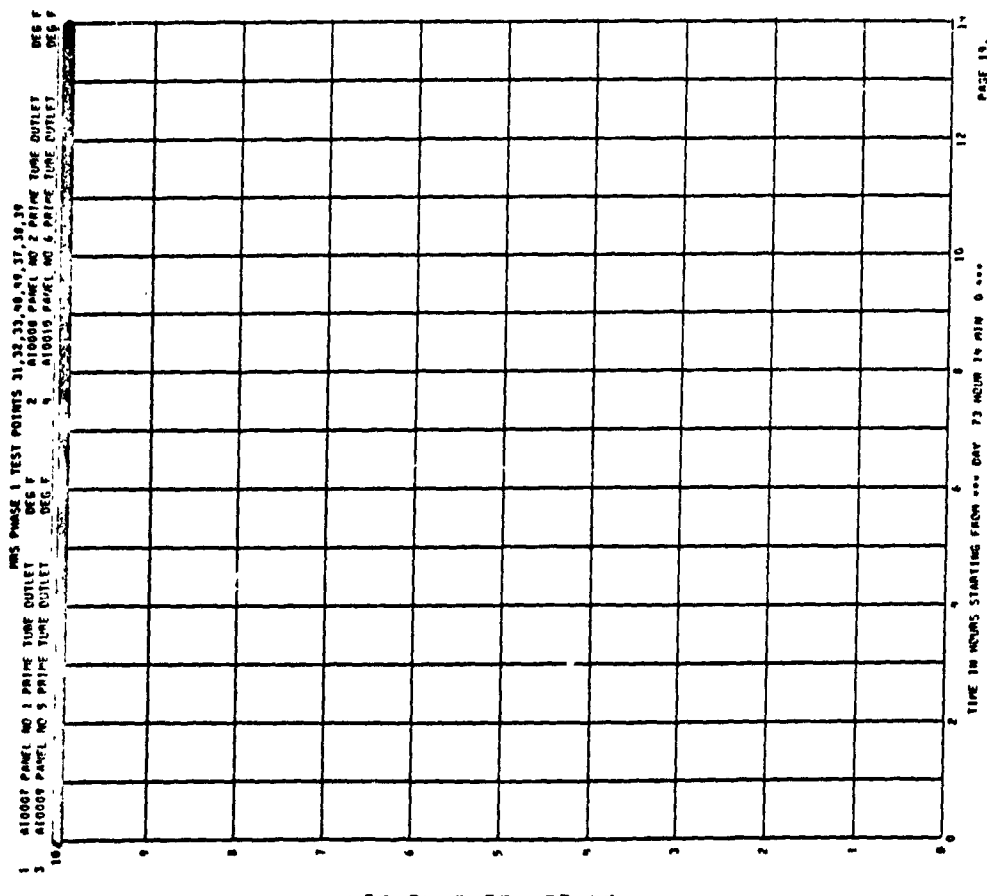


WMS PHASE 1 TEST POINTS 31, 32, 33, 48, 49, 37, 38, 39
 : AJ0002 BAW SYSTEM INLET
 DEG F

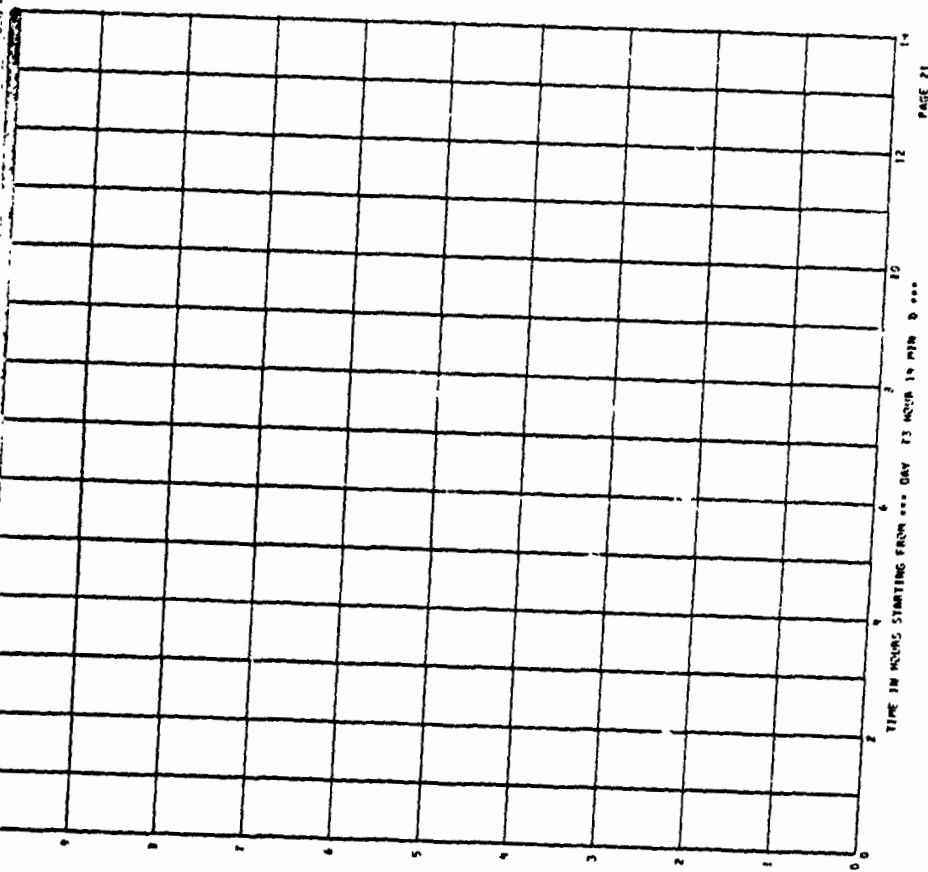




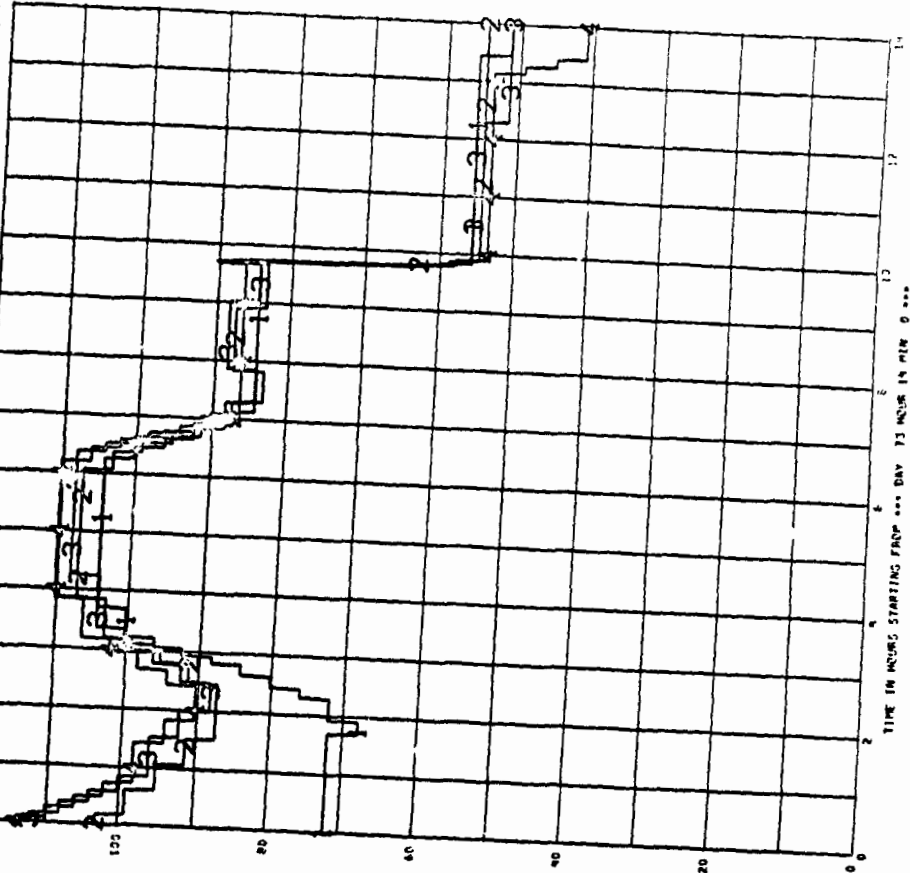


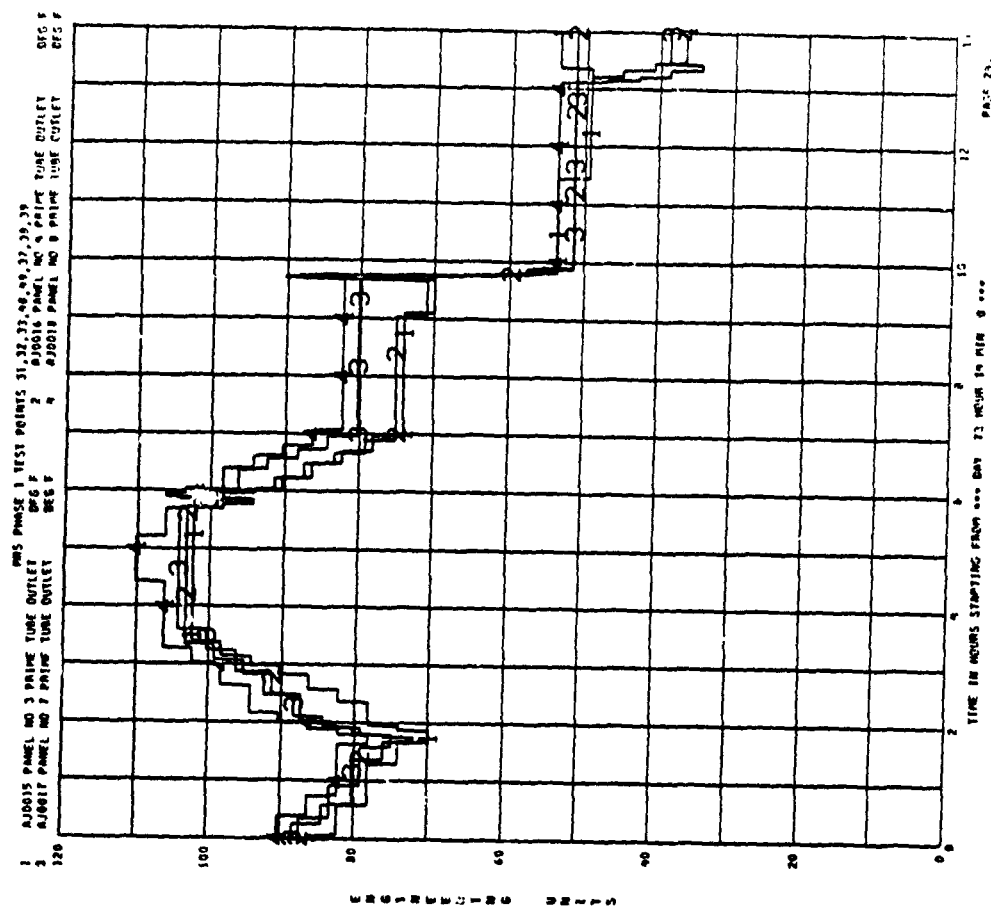
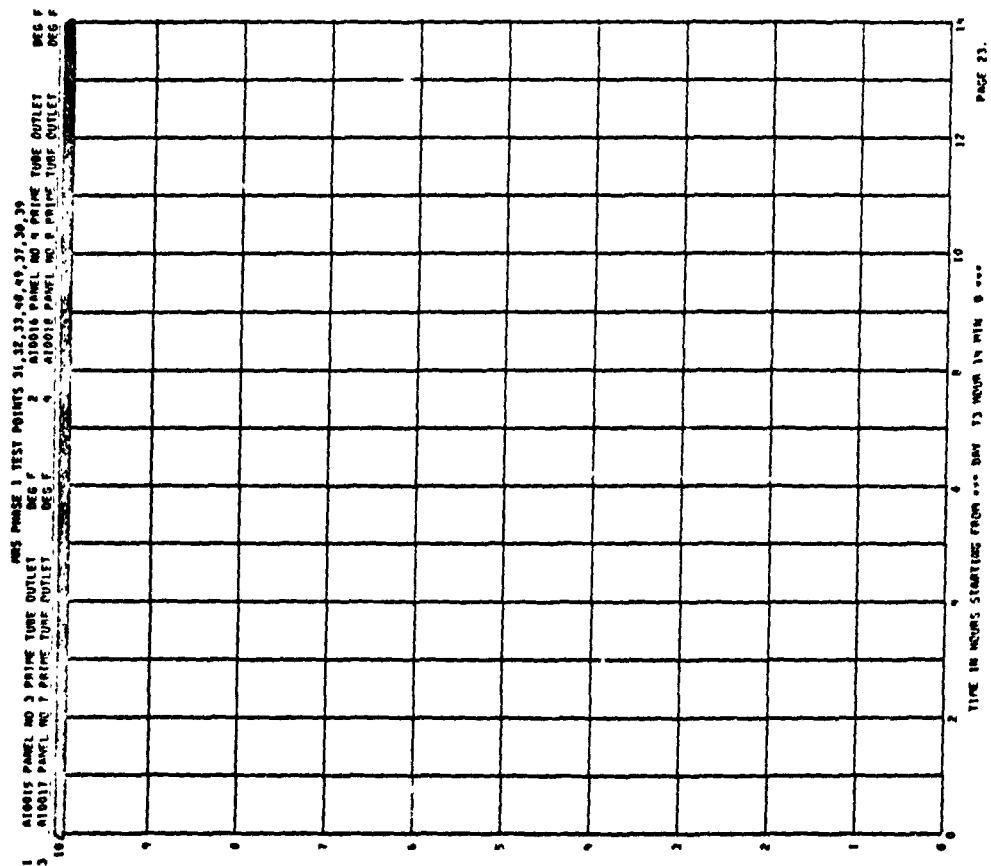


1. A10011 PANEL NO 3 PRIME TUBE INLET DEG P
 2. A10012 PANEL NO 4 PRIME TUBE INLET DEG P
 3. A10013 PANEL NO 5 PRIME TUBE INLET DEG P
 4. A10014 PANEL NO 6 PRIME TUBE INLET DEG P
 5. A10015 PANEL NO 7 PRIME TUBE INLET DEG P
 6. A10016 PANEL NO 8 PRIME TUBE INLET DEG P
 7. A10017 PANEL NO 9 PRIME TUBE INLET DEG P
 8. A10018 PANEL NO 10 PRIME TUBE INLET DEG P
 9. A10019 PANEL NO 11 PRIME TUBE INLET DEG P
 10. A10020 PANEL NO 12 PRIME TUBE INLET DEG P

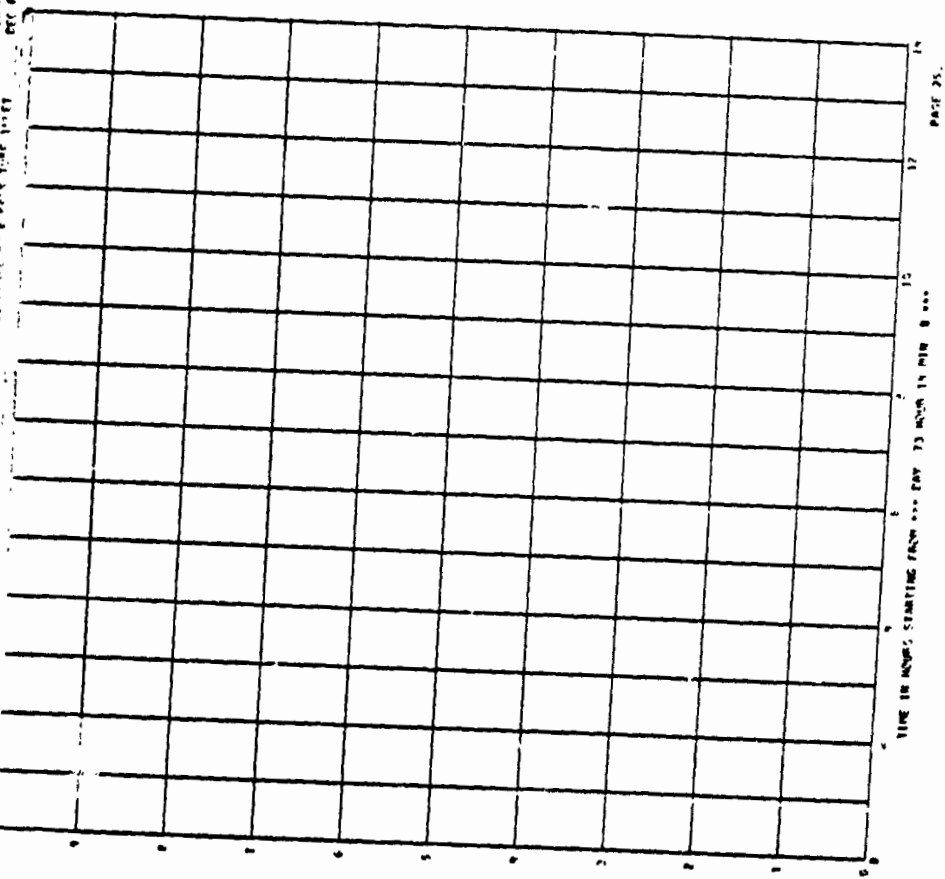


1. A10011 PANEL NO 3 PRIME TUBE INLET DEG P
 2. A10012 PANEL NO 4 PRIME TUBE INLET DEG P
 3. A10013 PANEL NO 5 PRIME TUBE INLET DEG P
 4. A10014 PANEL NO 6 PRIME TUBE INLET DEG P
 5. A10015 PANEL NO 7 PRIME TUBE INLET DEG P
 6. A10016 PANEL NO 8 PRIME TUBE INLET DEG P
 7. A10017 PANEL NO 9 PRIME TUBE INLET DEG P
 8. A10018 PANEL NO 10 PRIME TUBE INLET DEG P
 9. A10019 PANEL NO 11 PRIME TUBE INLET DEG P
 10. A10020 PANEL NO 12 PRIME TUBE INLET DEG P



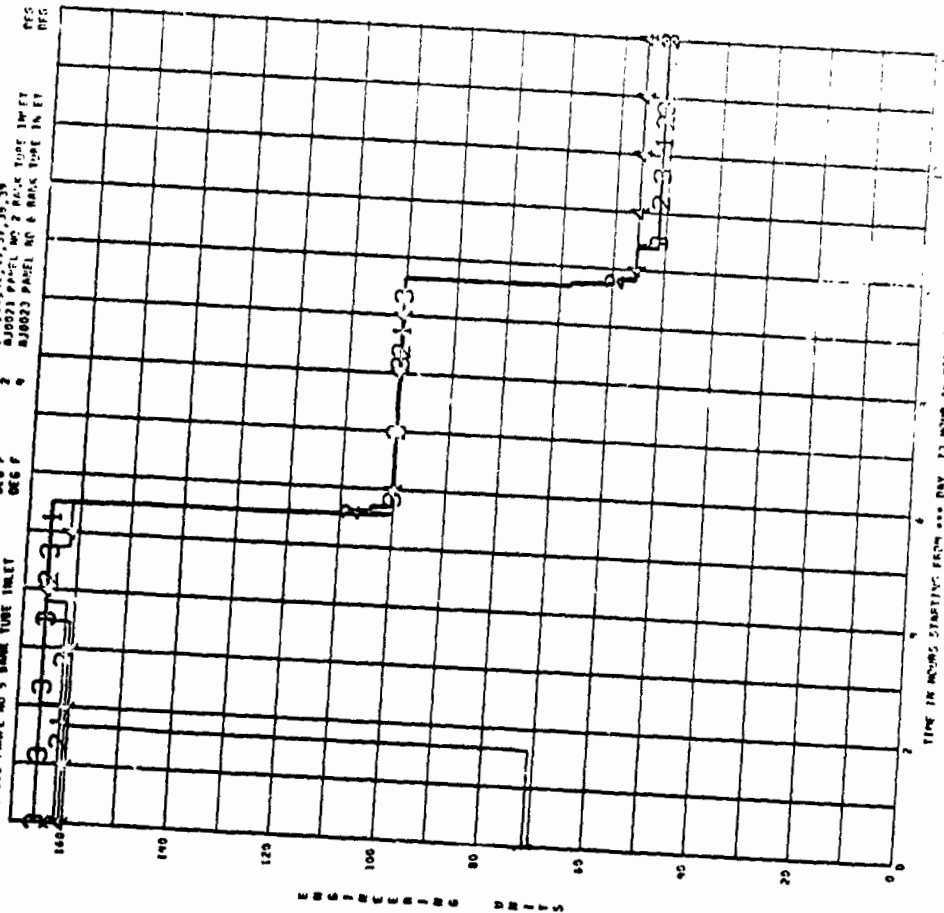


1. A10020 PANEL NO 1 BACK TUBE INLET DEG F
 2. A10021 PANEL NO 2 BACK TUBE INLET DEG F
 3. A10022 PANEL NO 3 BACK TUBE INLET DEG F
 4. A10023 PANEL NO 4 BACK TUBE INLET DEG F
 5. A10024 PANEL NO 5 BACK TUBE INLET DEG F
 6. A10025 PANEL NO 6 BACK TUBE INLET DEG F
 7. A10026 PANEL NO 7 BACK TUBE INLET DEG F
 8. A10027 PANEL NO 8 BACK TUBE INLET DEG F
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 10. A10029 PANEL NO 10 BACK TUBE INLET DEG F

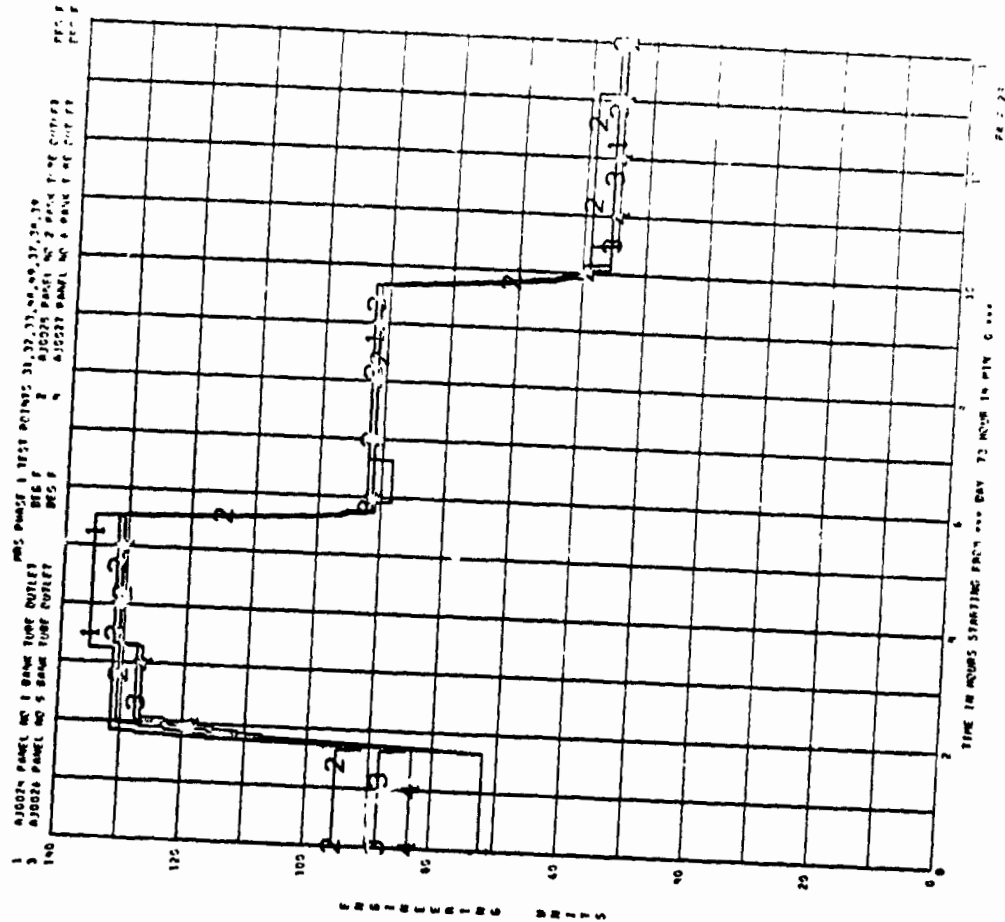
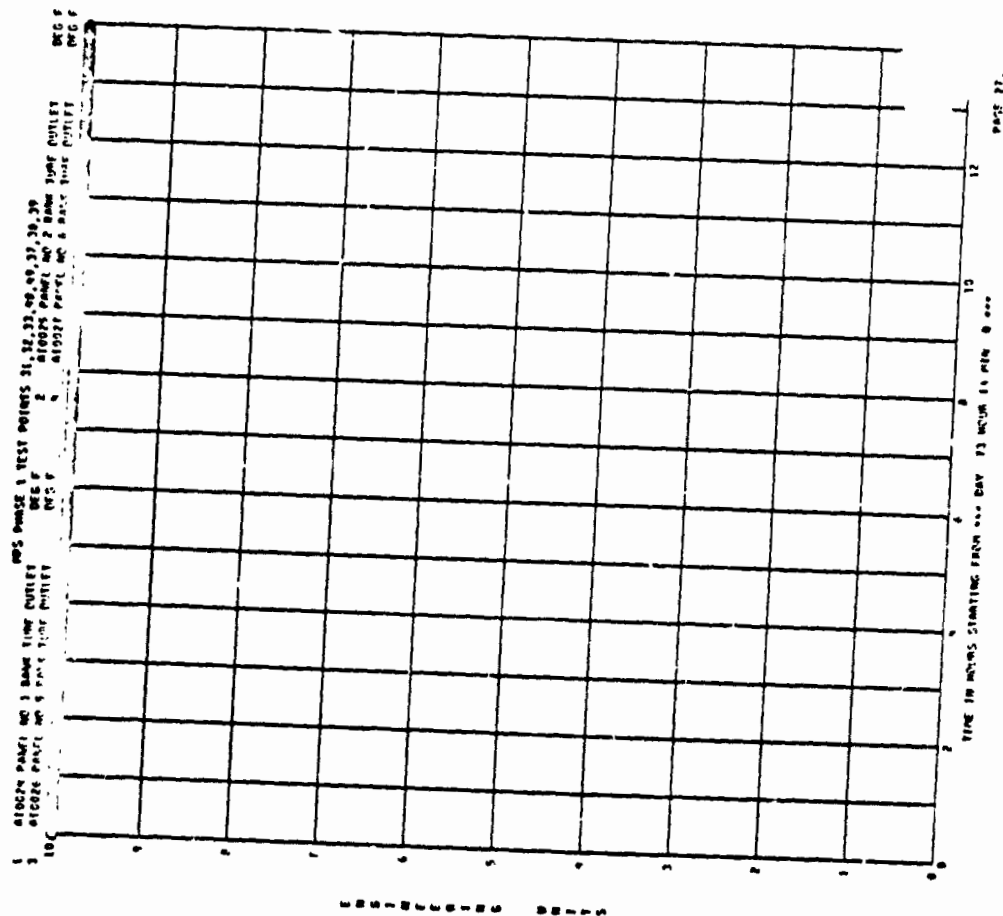


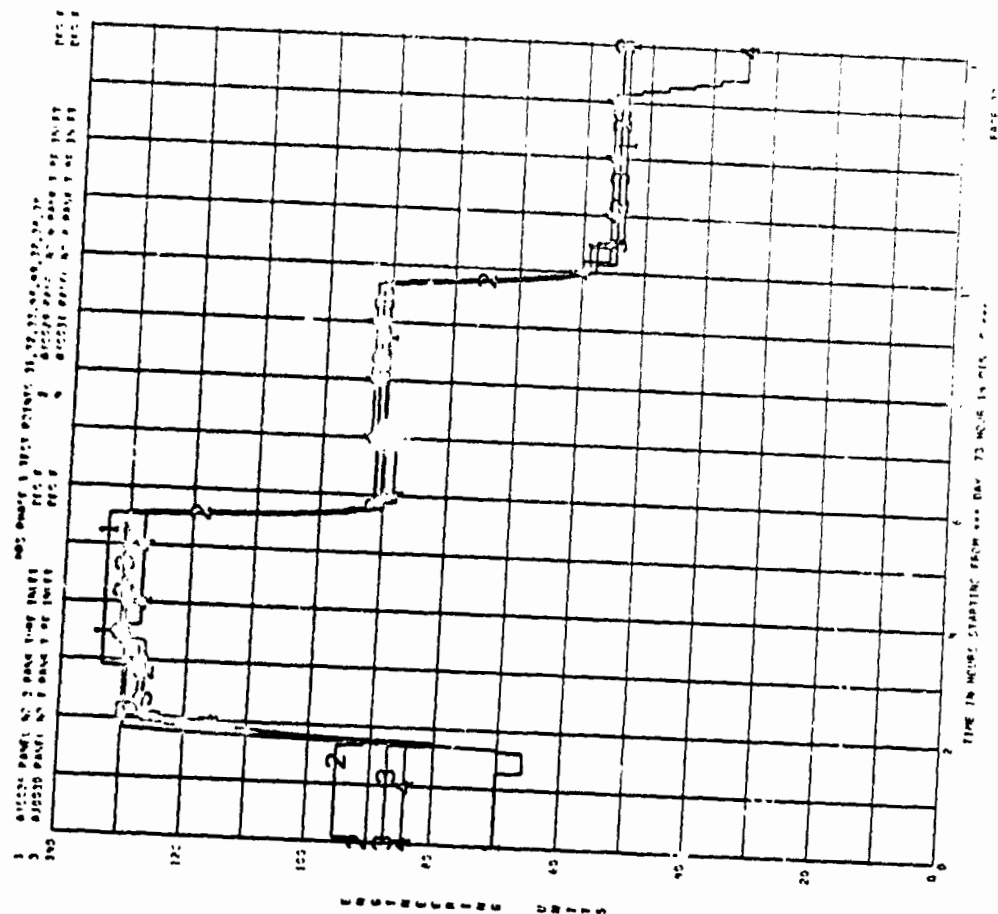
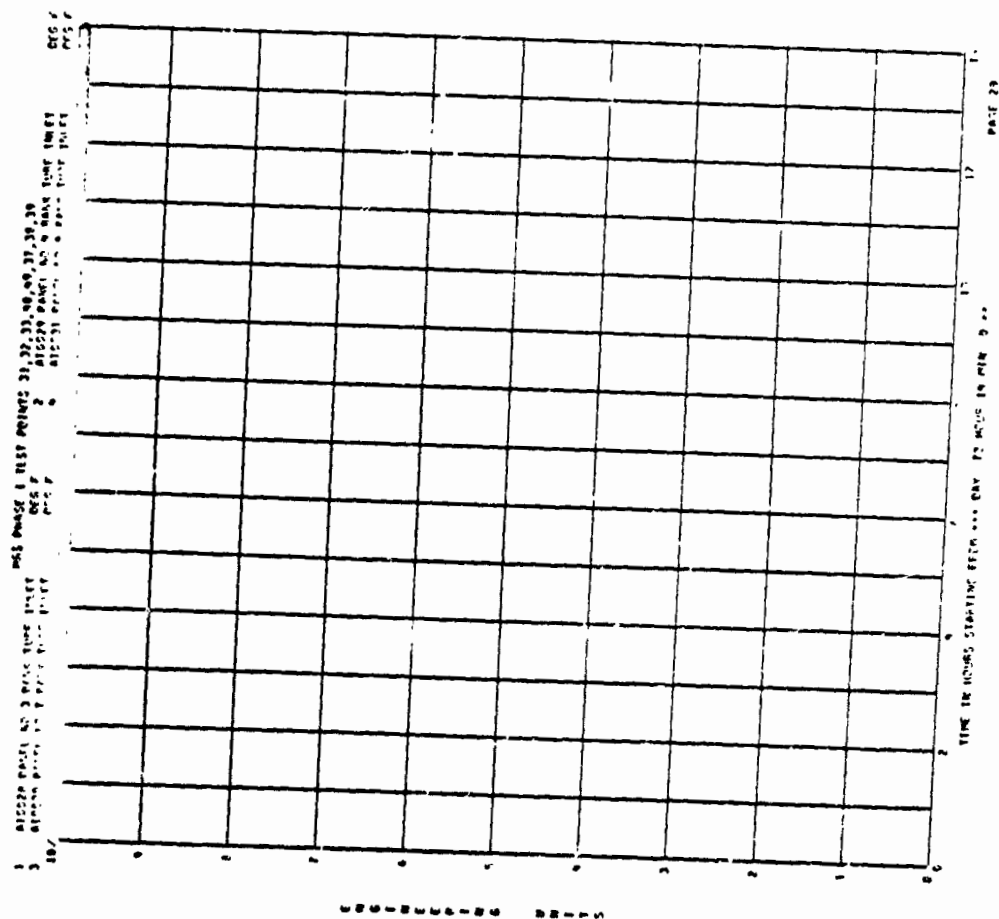
PAGE 25.

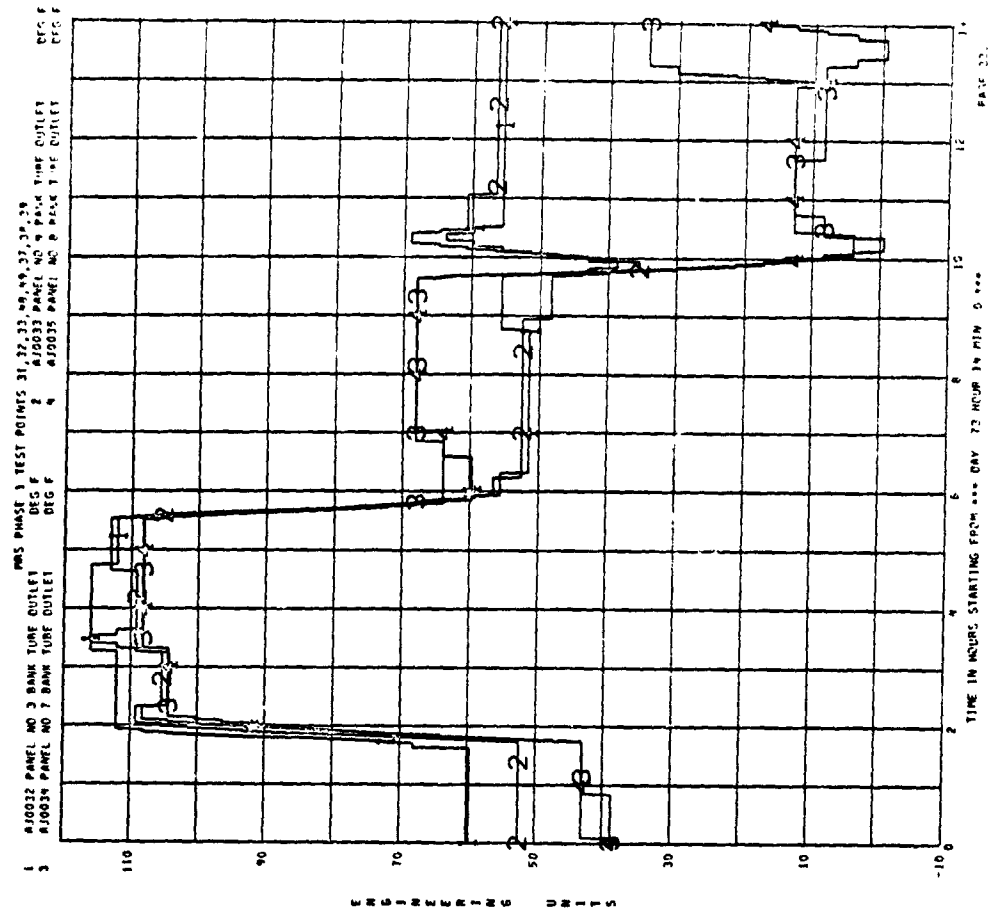
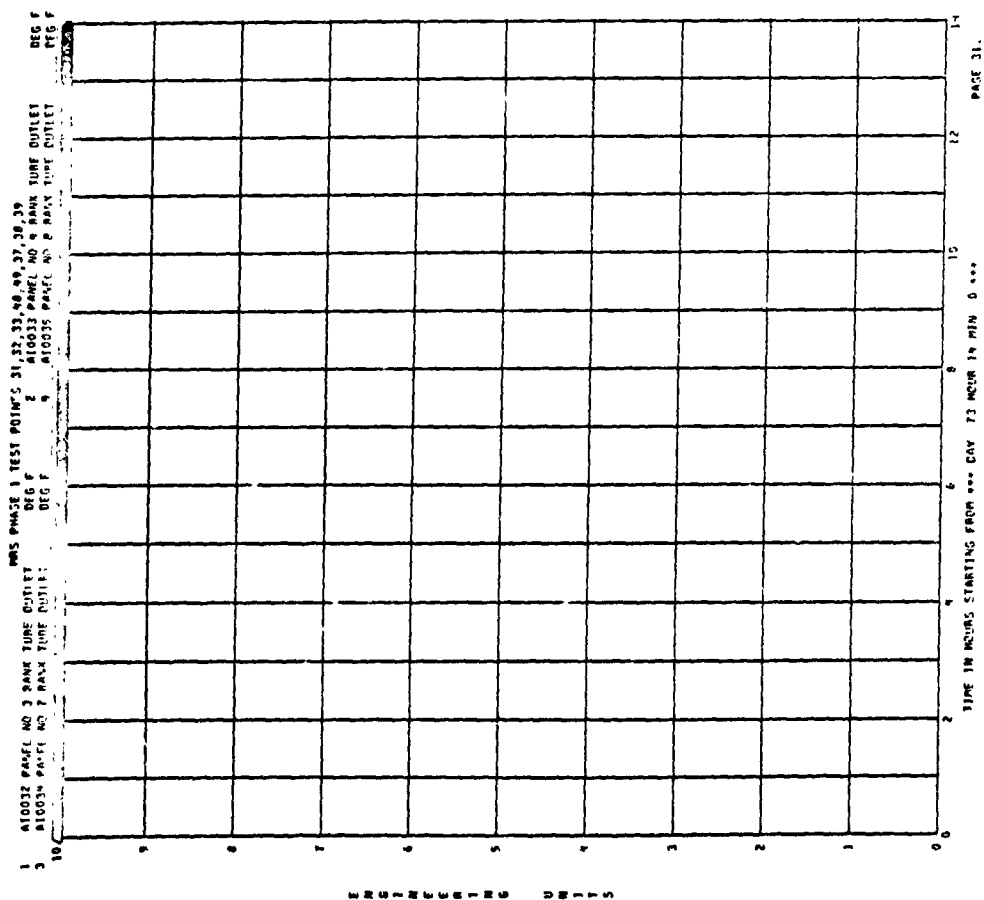
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 2. A10011 PANEL NO 2 BACK TUBE INLET DEG F
 3. A10012 PANEL NO 3 BACK TUBE INLET DEG F
 4. A10013 PANEL NO 4 BACK TUBE INLET DEG F
 5. A10014 PANEL NO 5 BACK TUBE INLET DEG F
 6. A10015 PANEL NO 6 BACK TUBE INLET DEG F
 7. A10016 PANEL NO 7 BACK TUBE INLET DEG F
 8. A10017 PANEL NO 8 BACK TUBE INLET DEG F
 9. A10018 PANEL NO 9 BACK TUBE INLET DEG F
 10. A10019 PANEL NO 10 BACK TUBE INLET DEG F

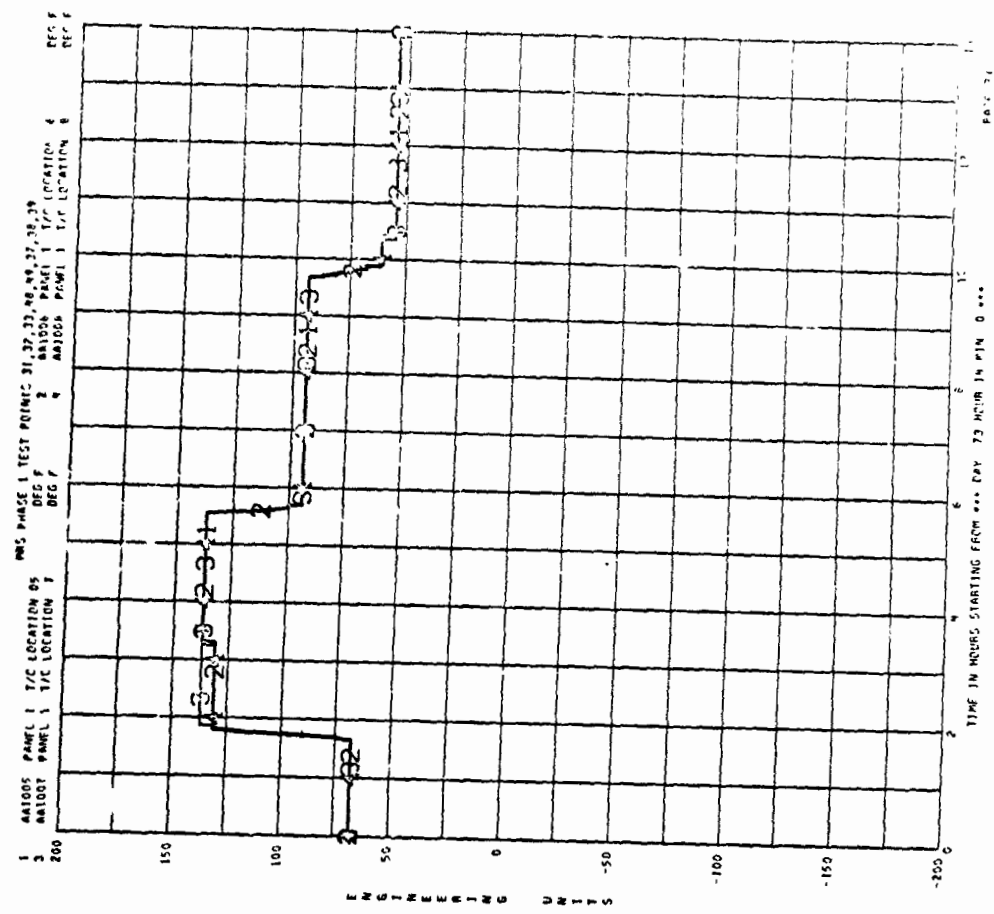
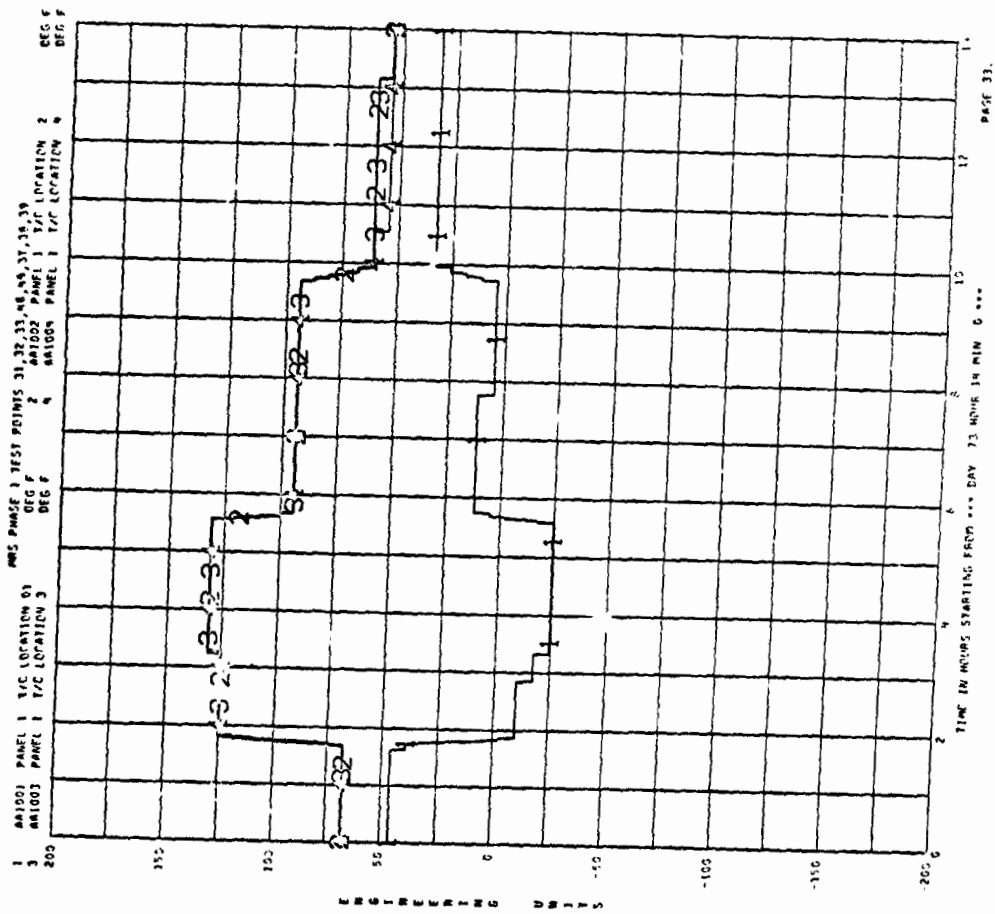


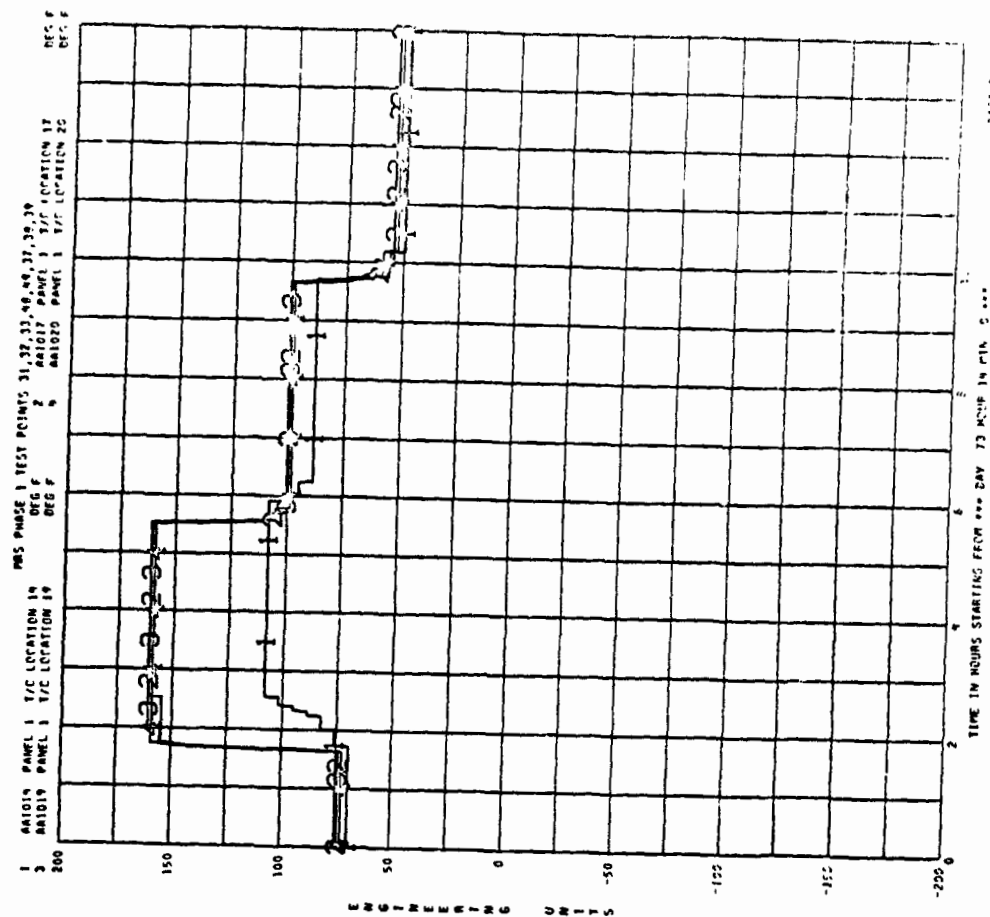
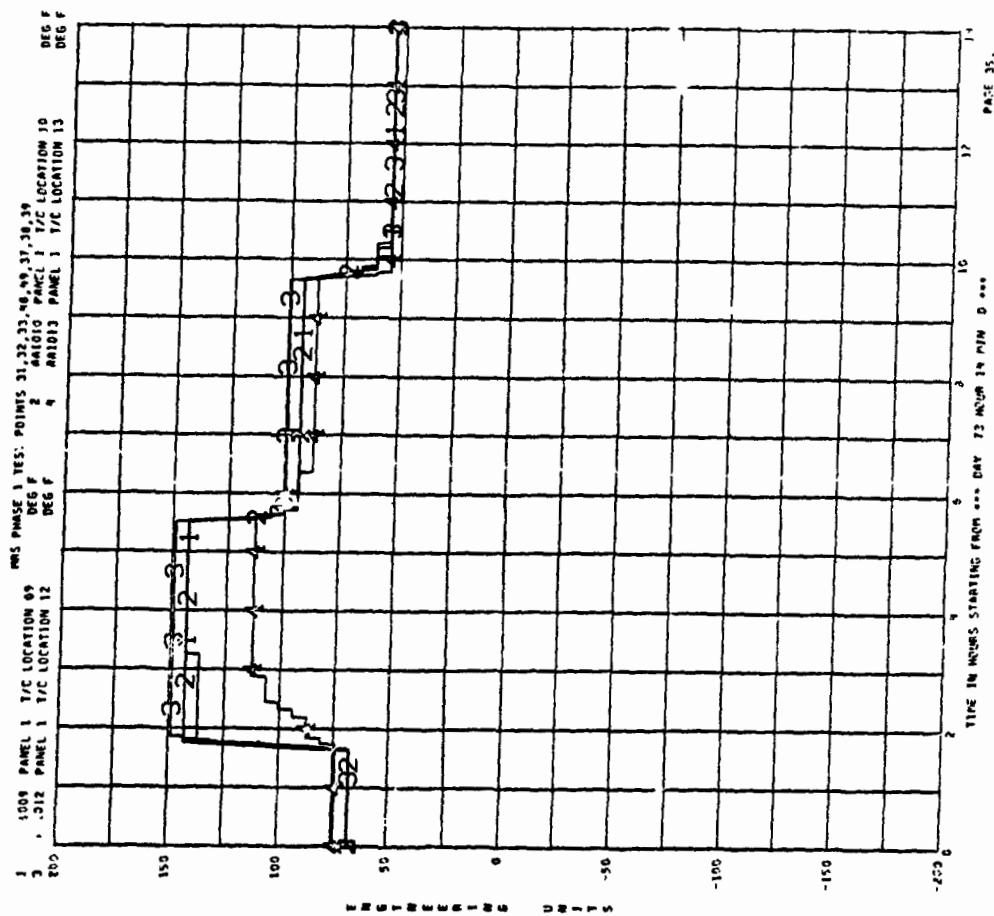
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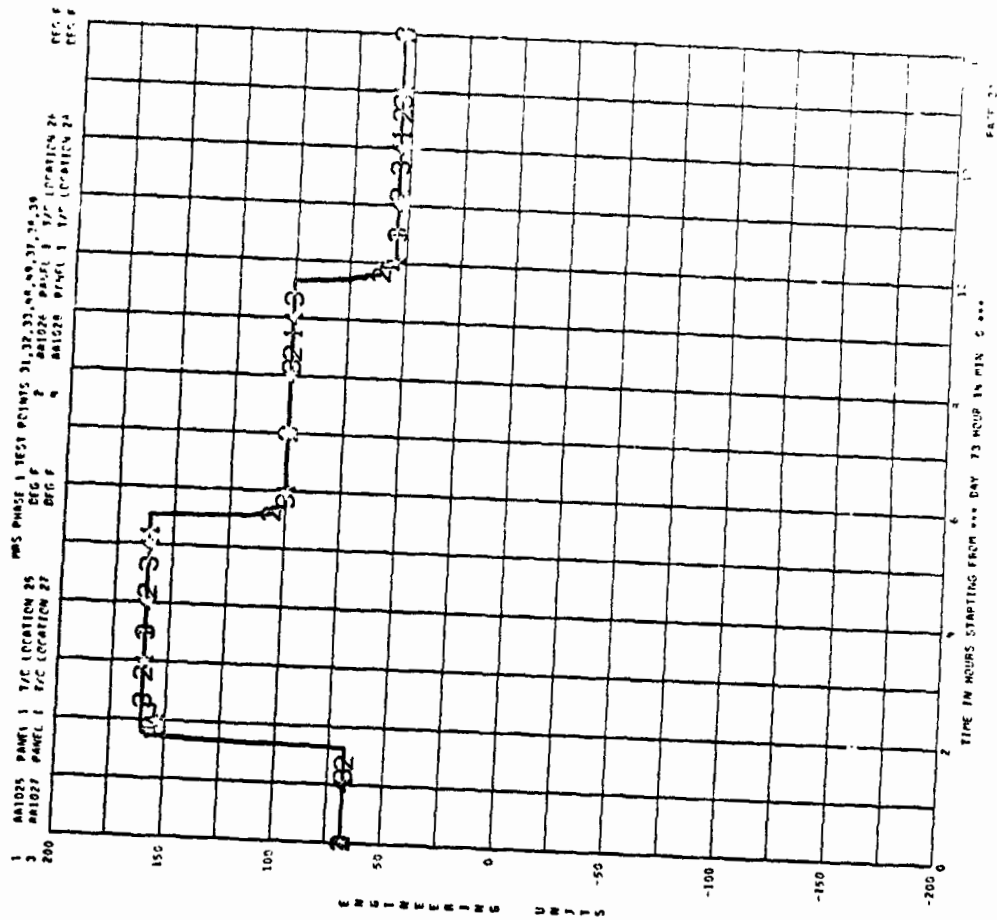
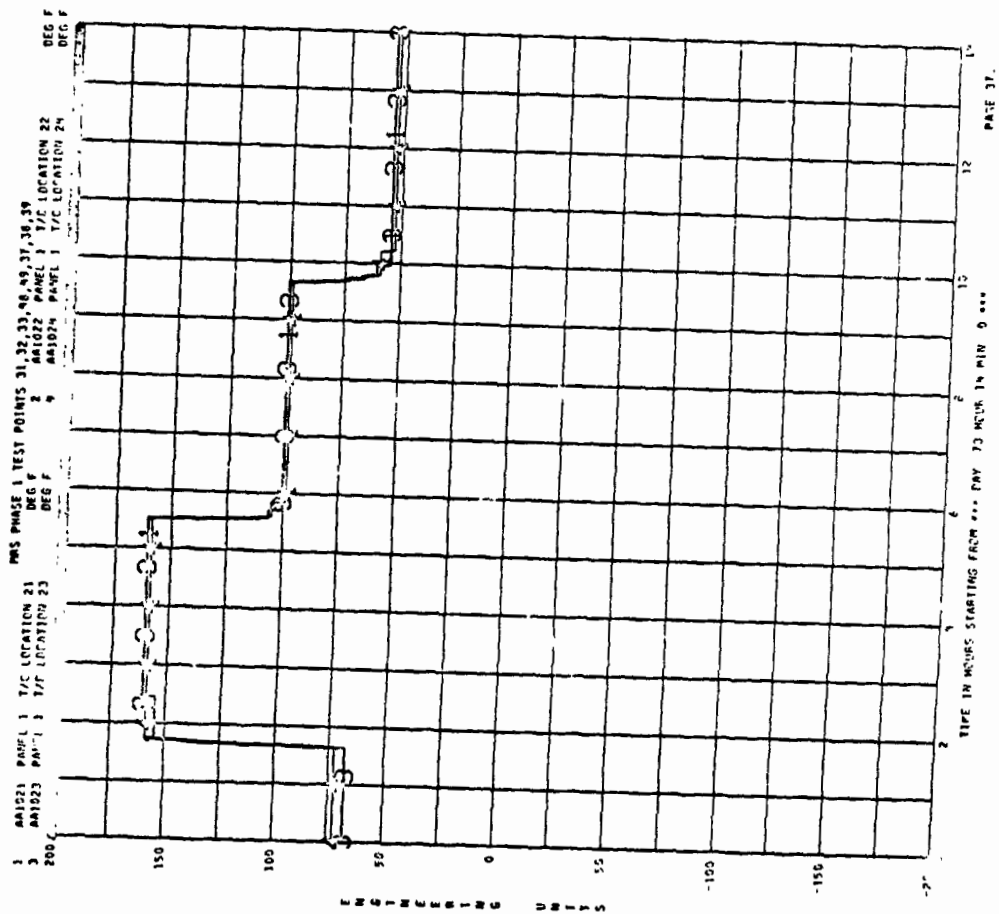


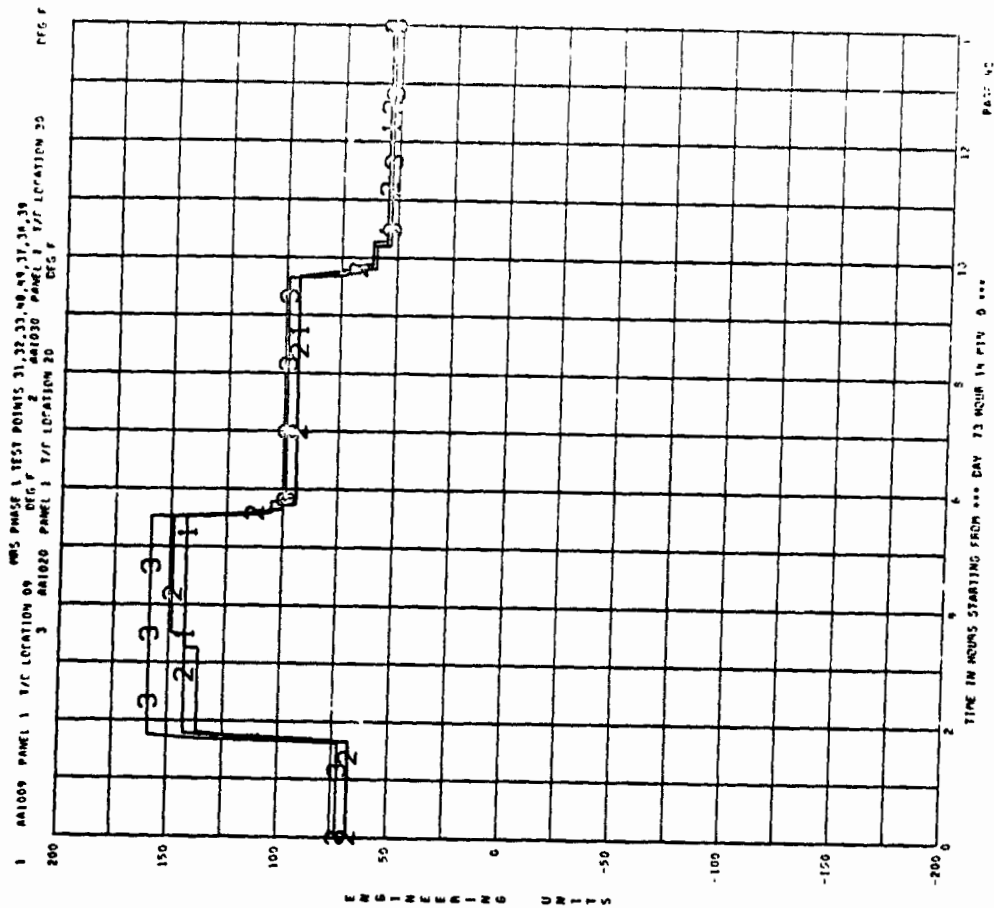
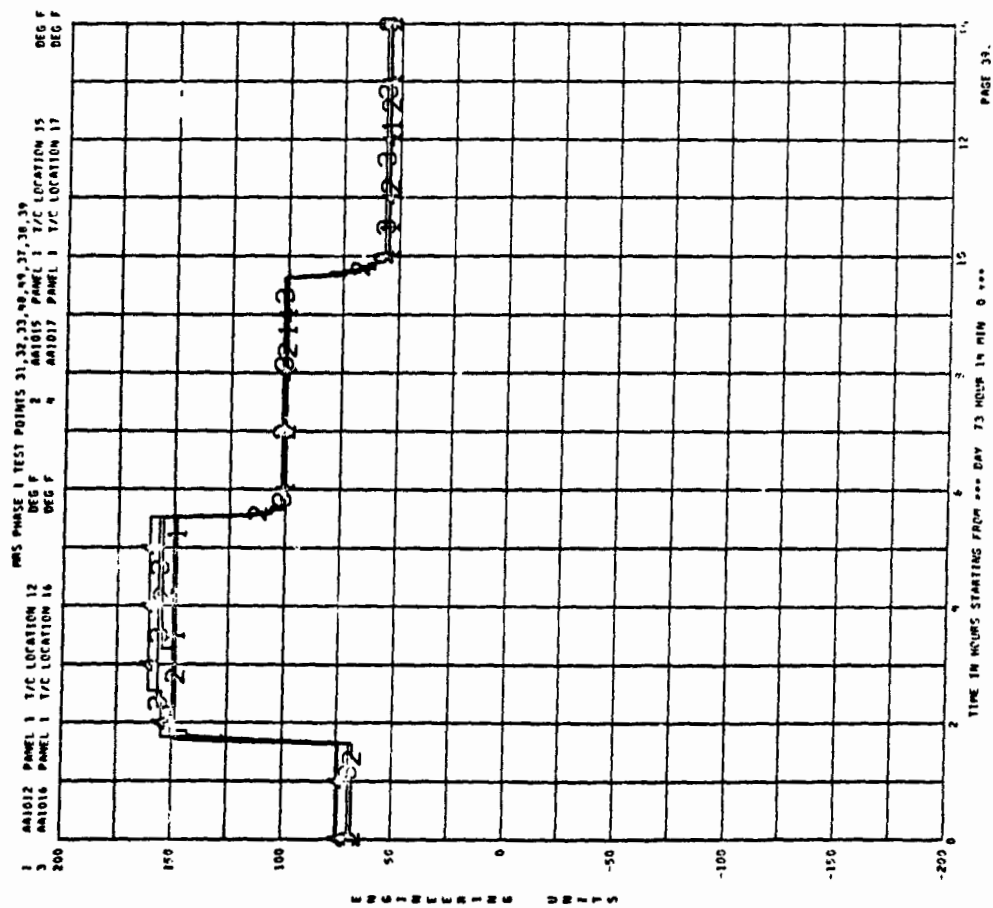


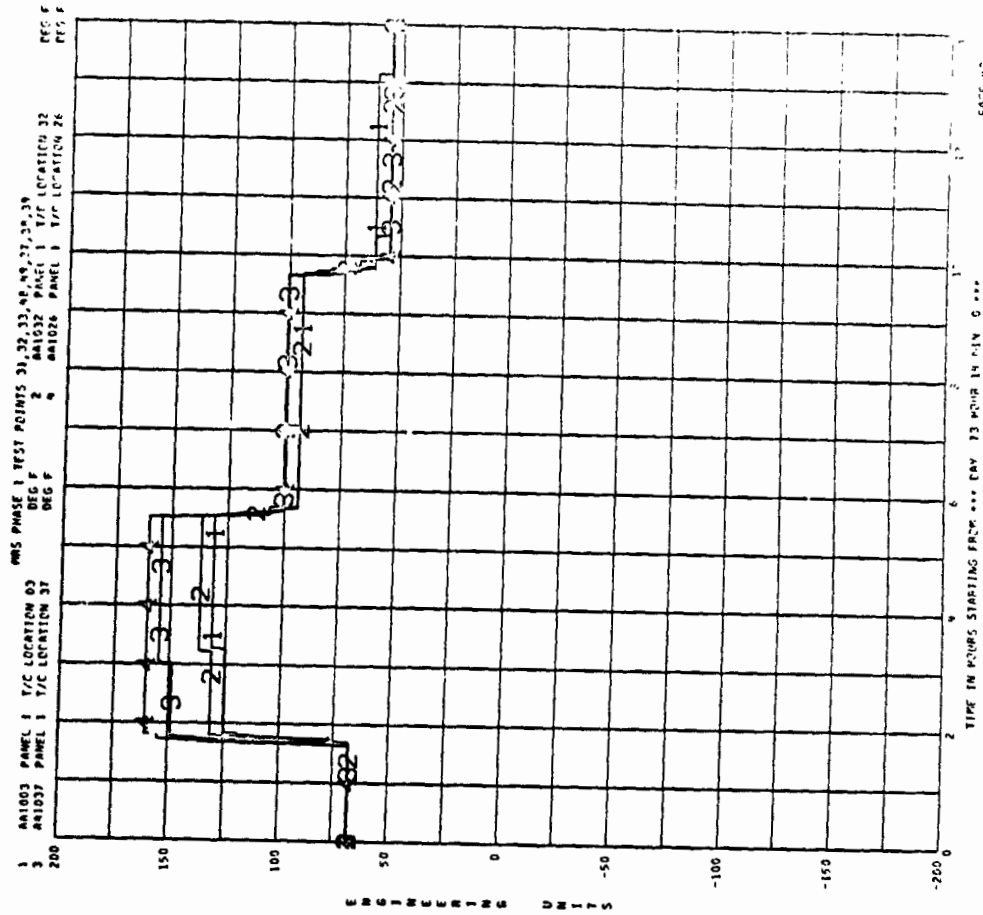
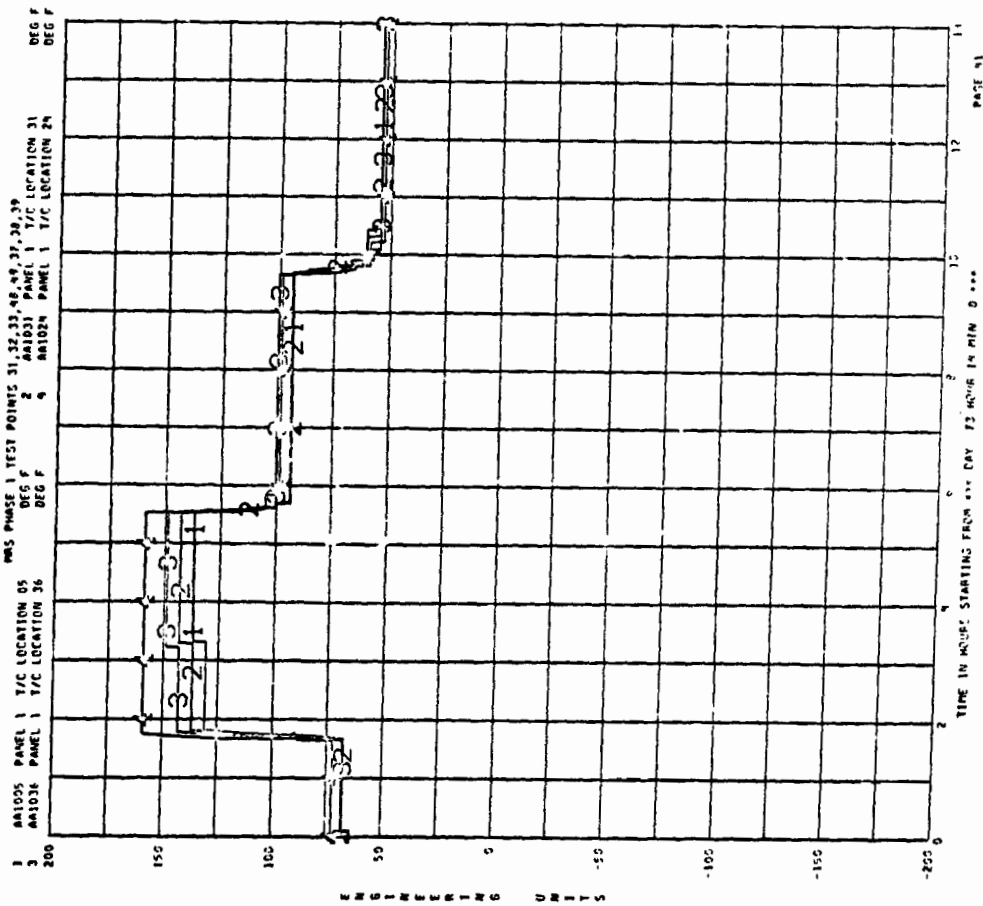


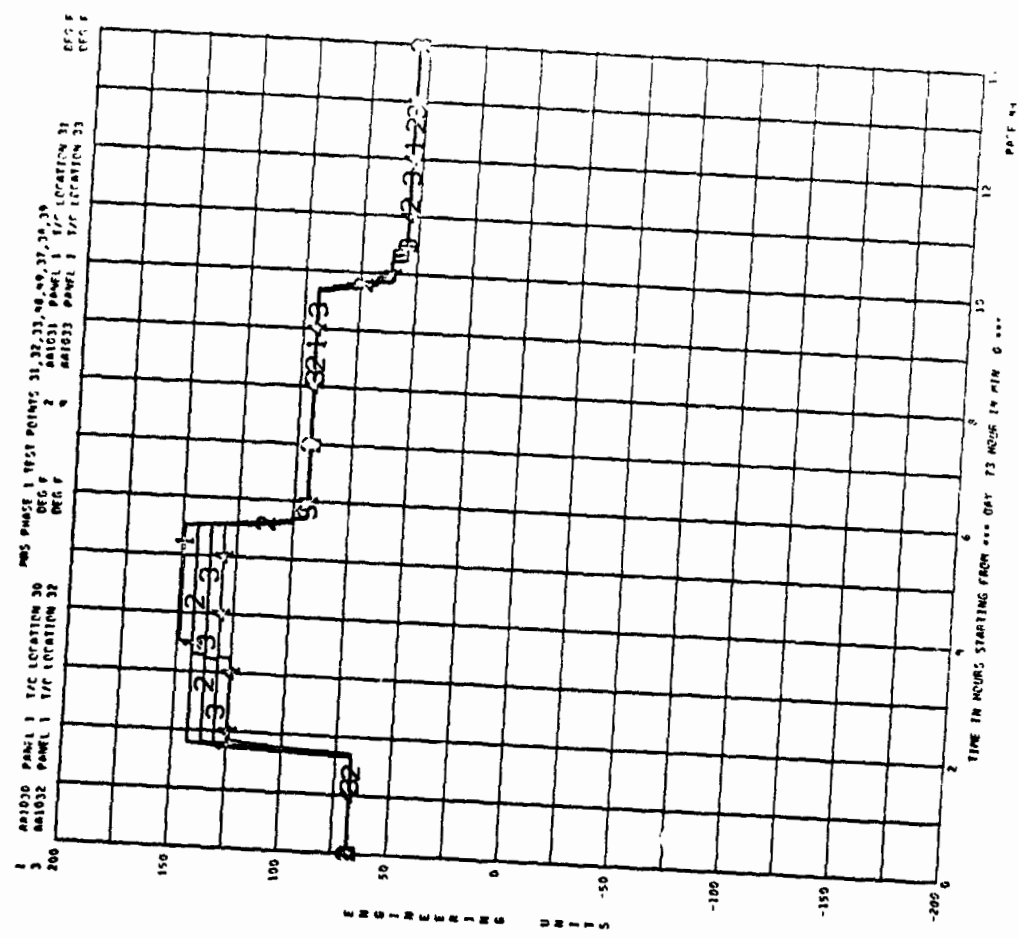
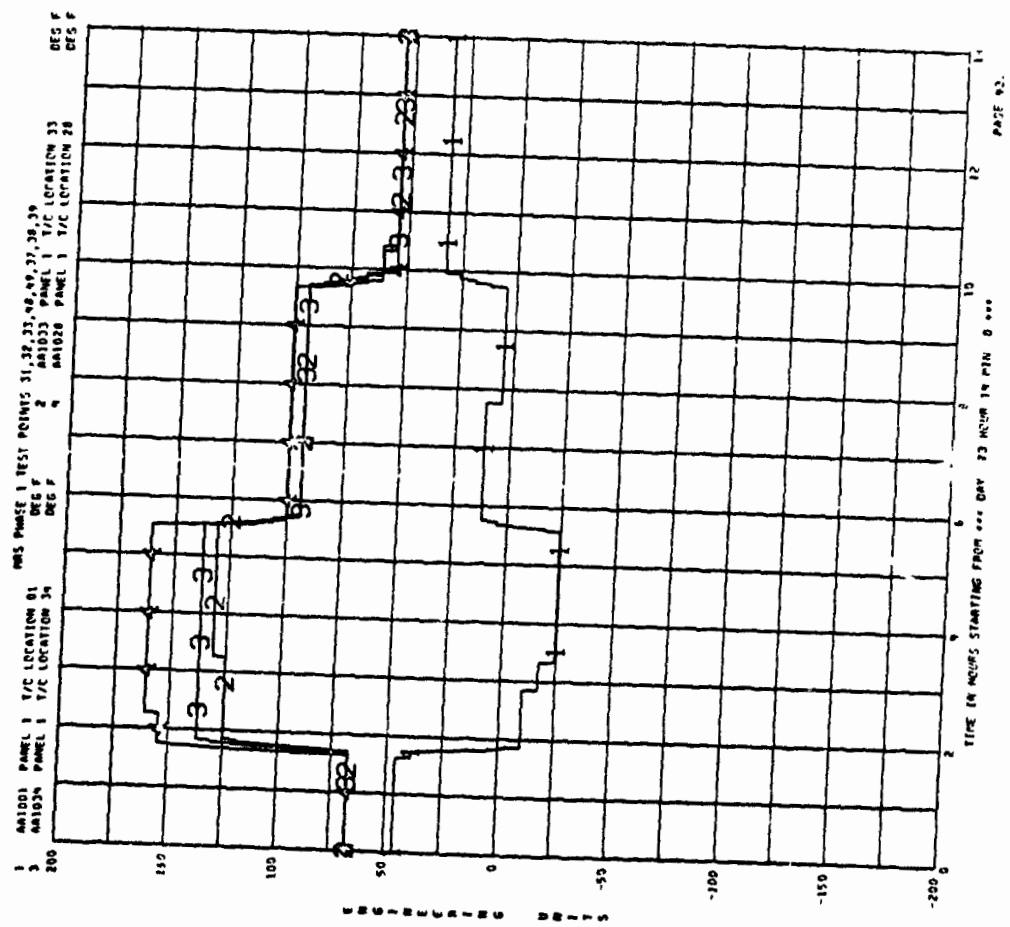


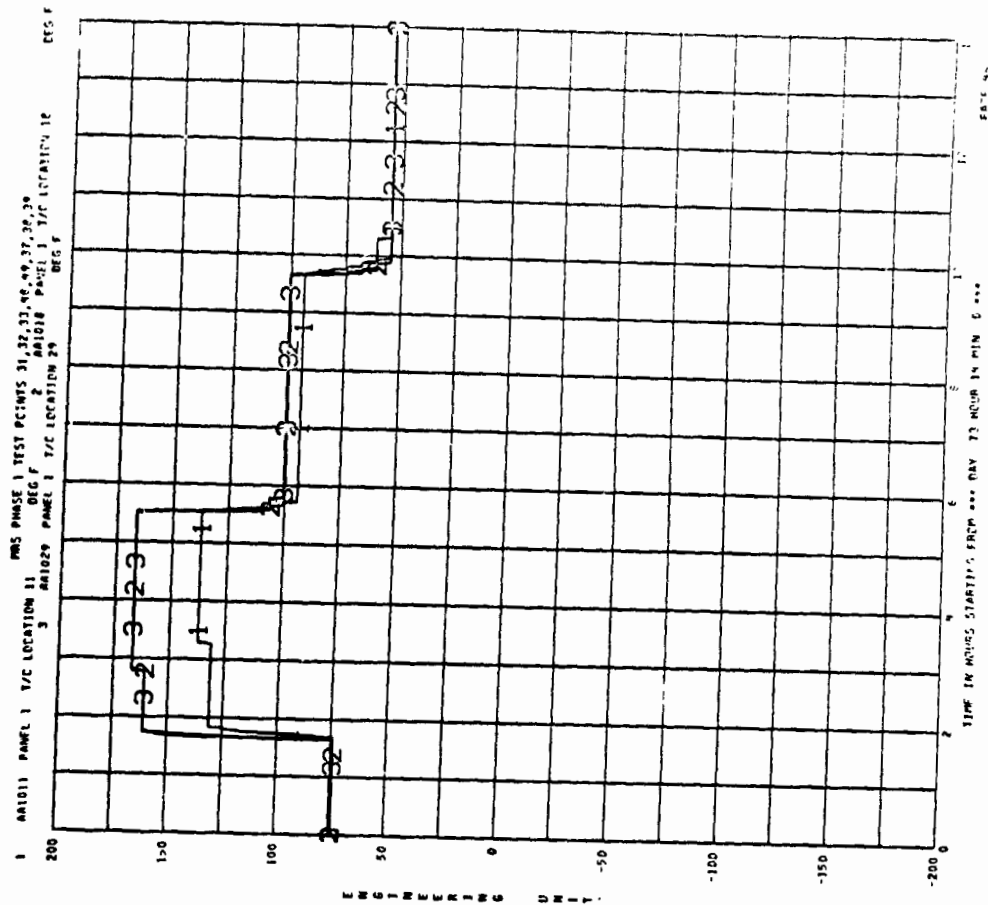
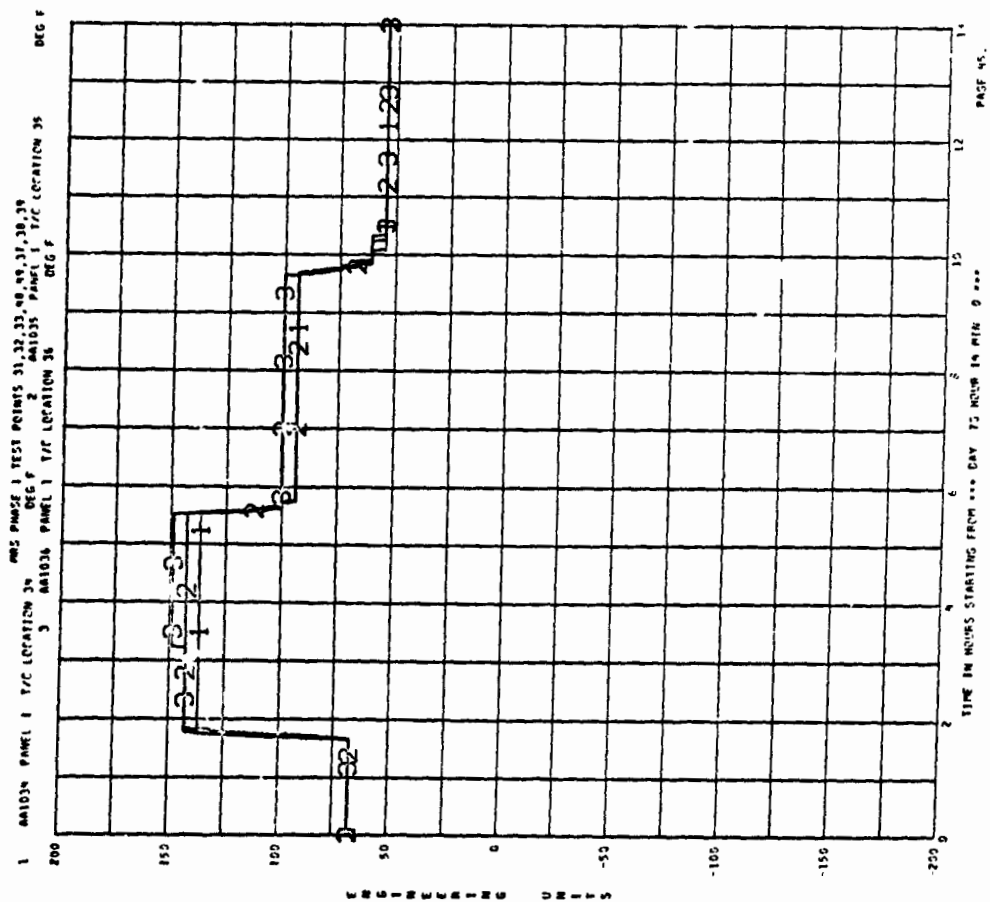


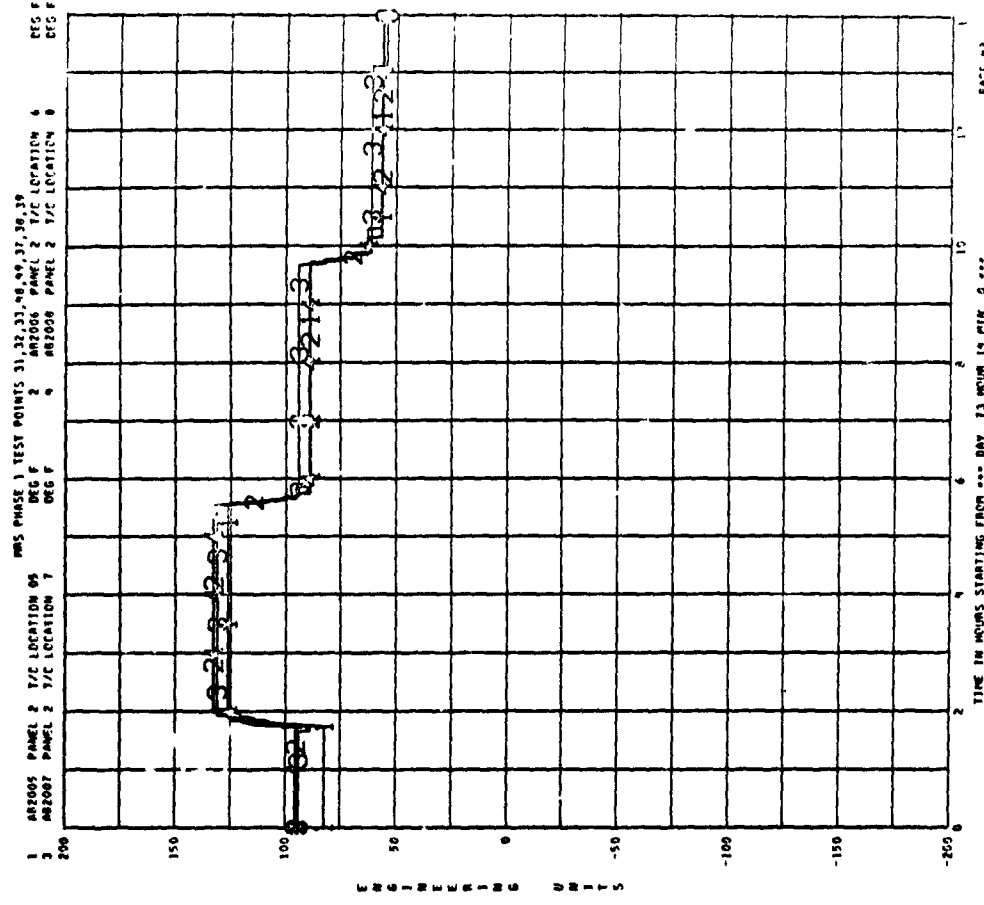
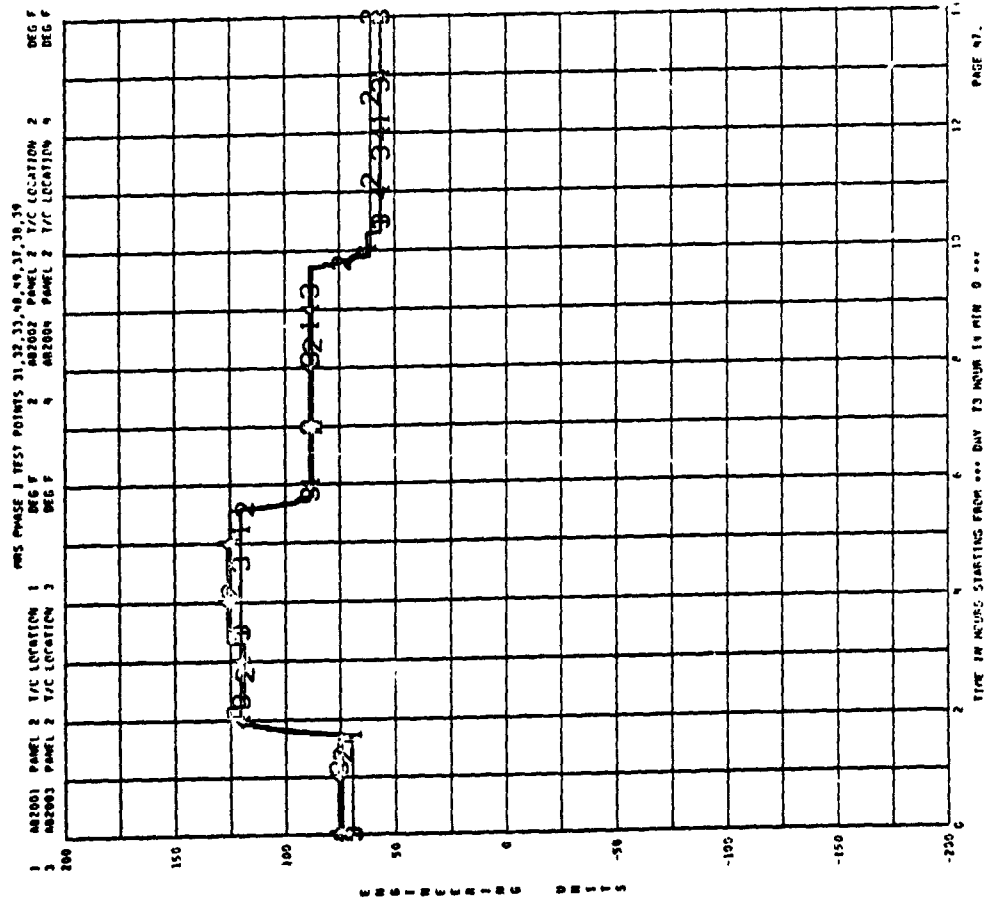


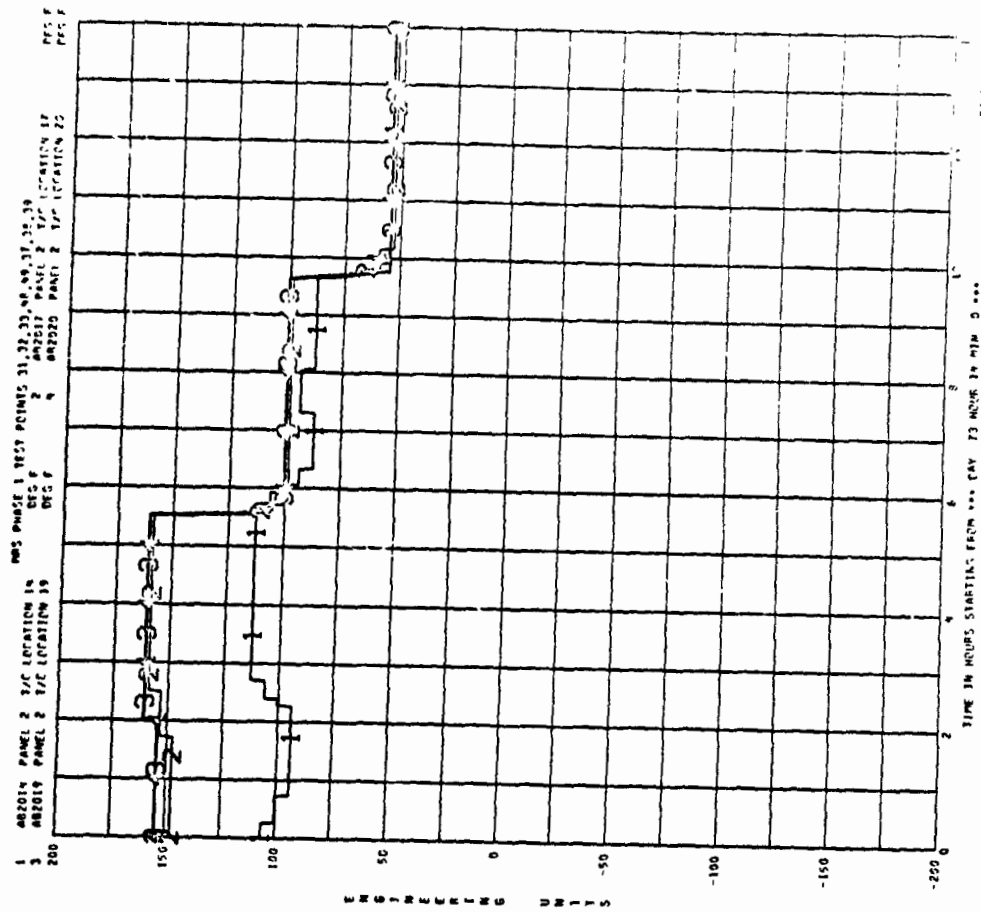
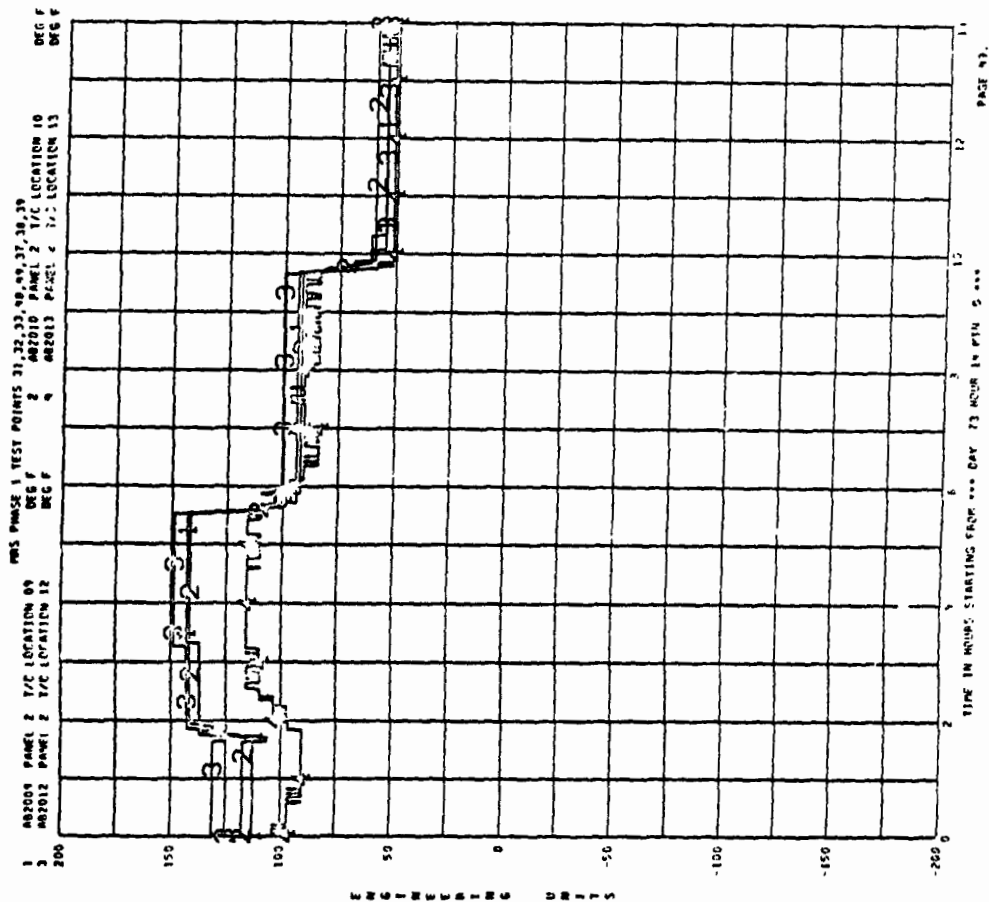


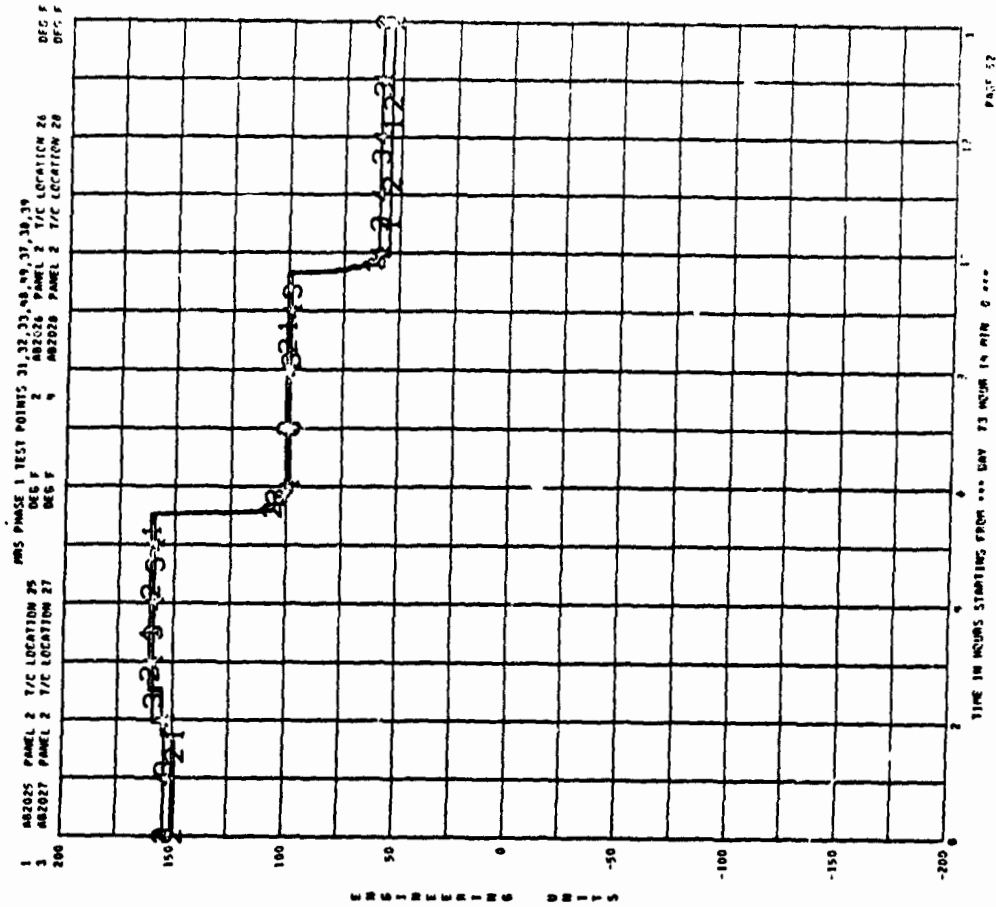
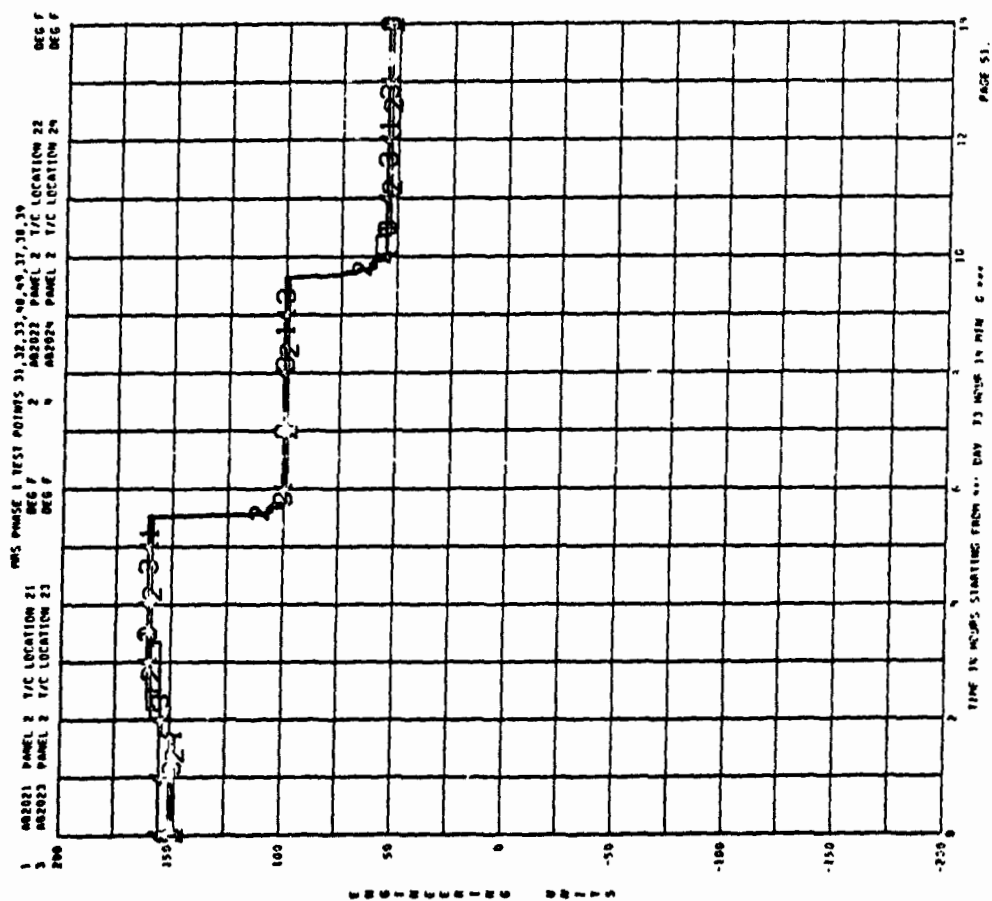


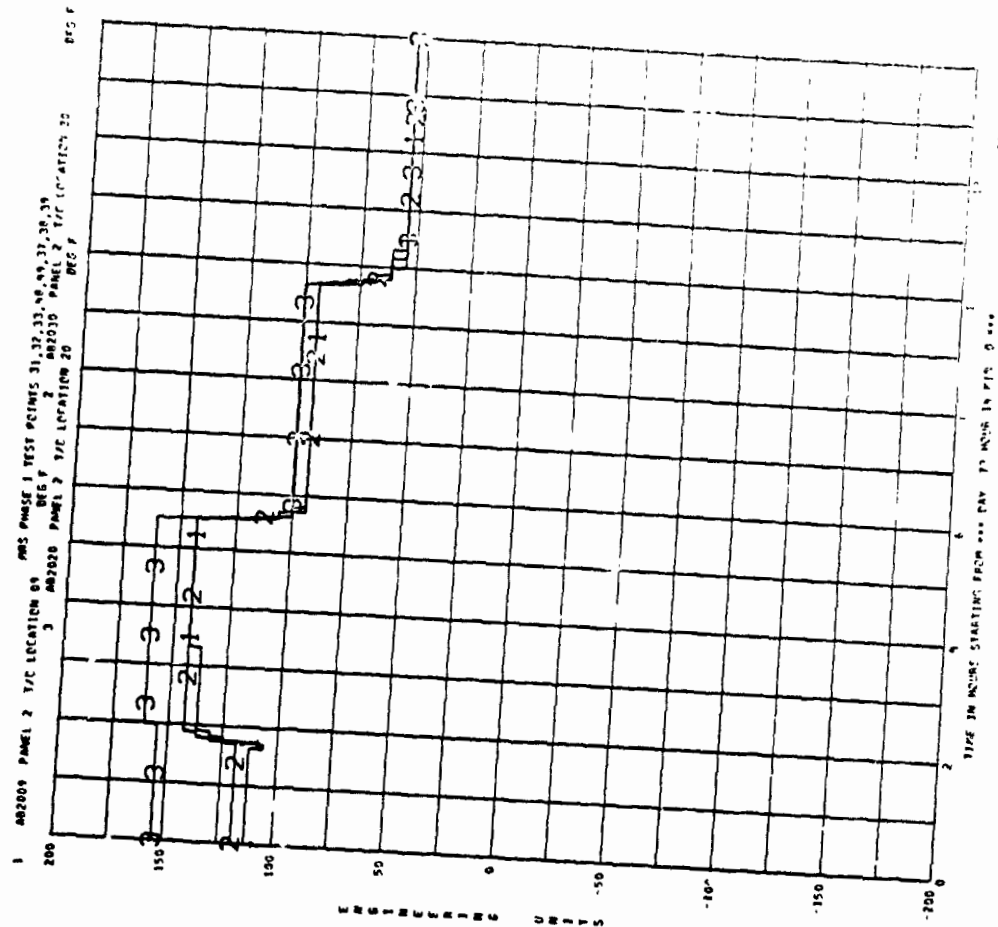
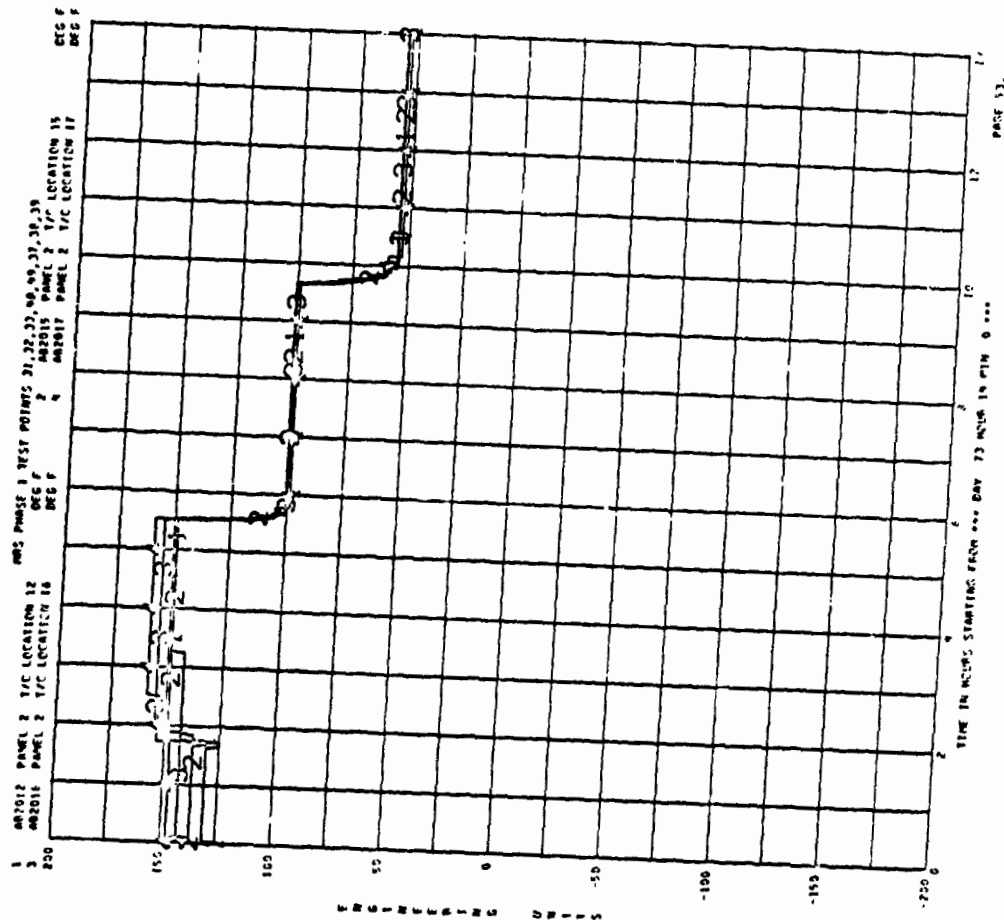


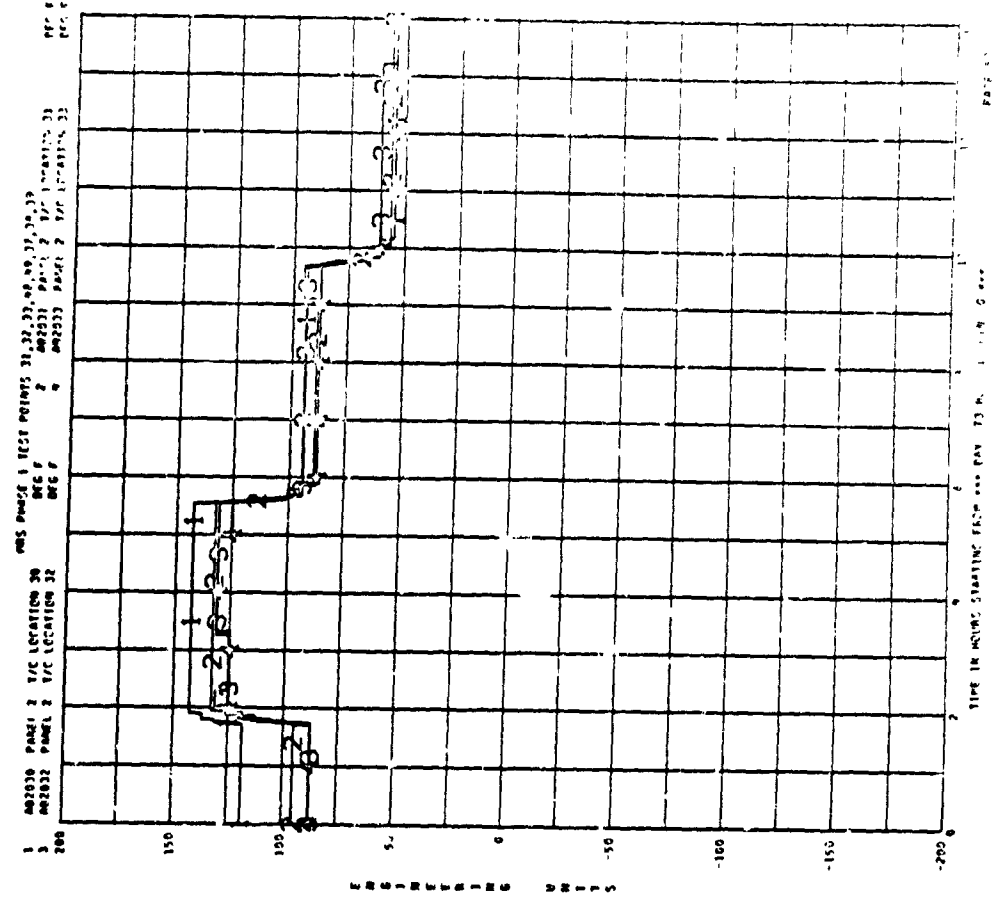
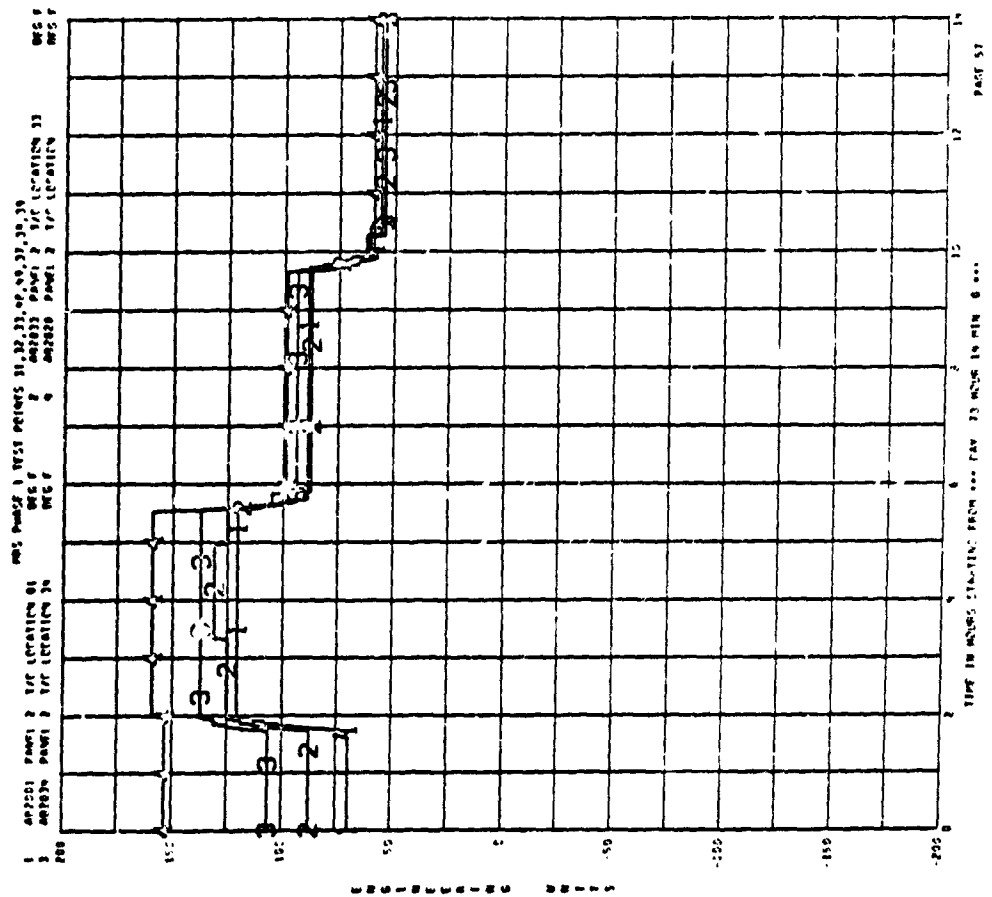


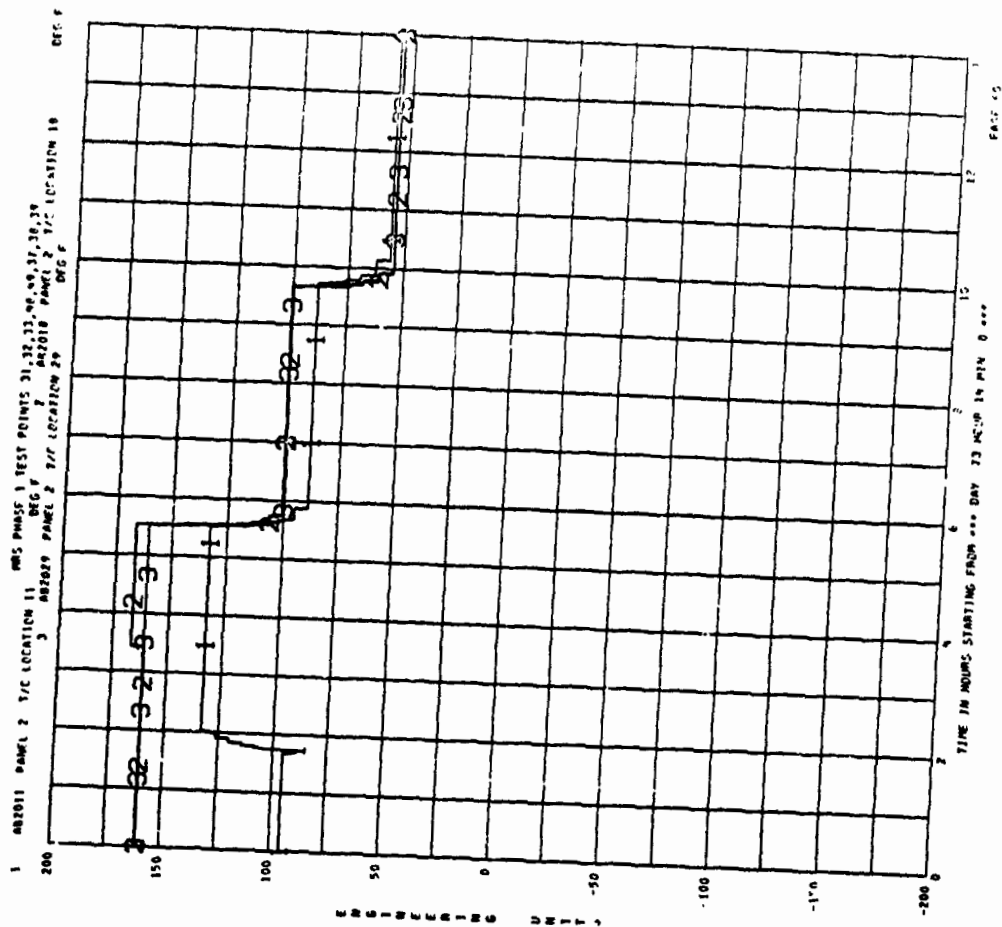
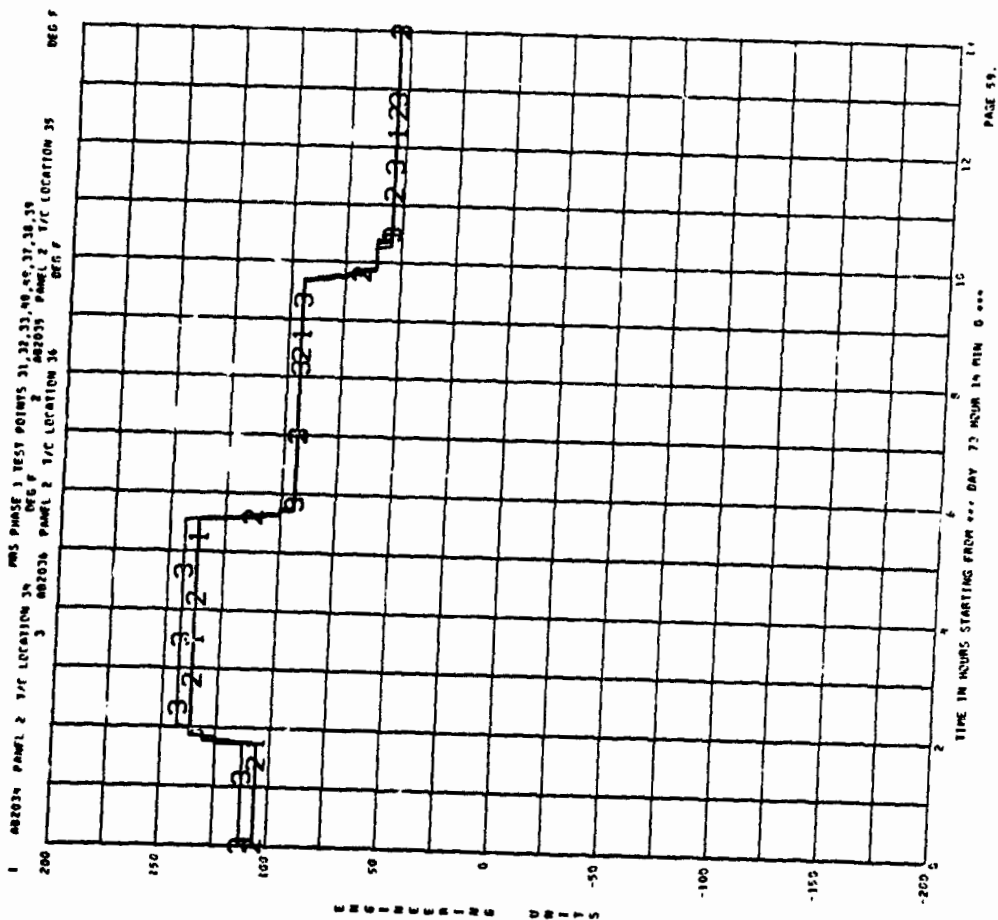


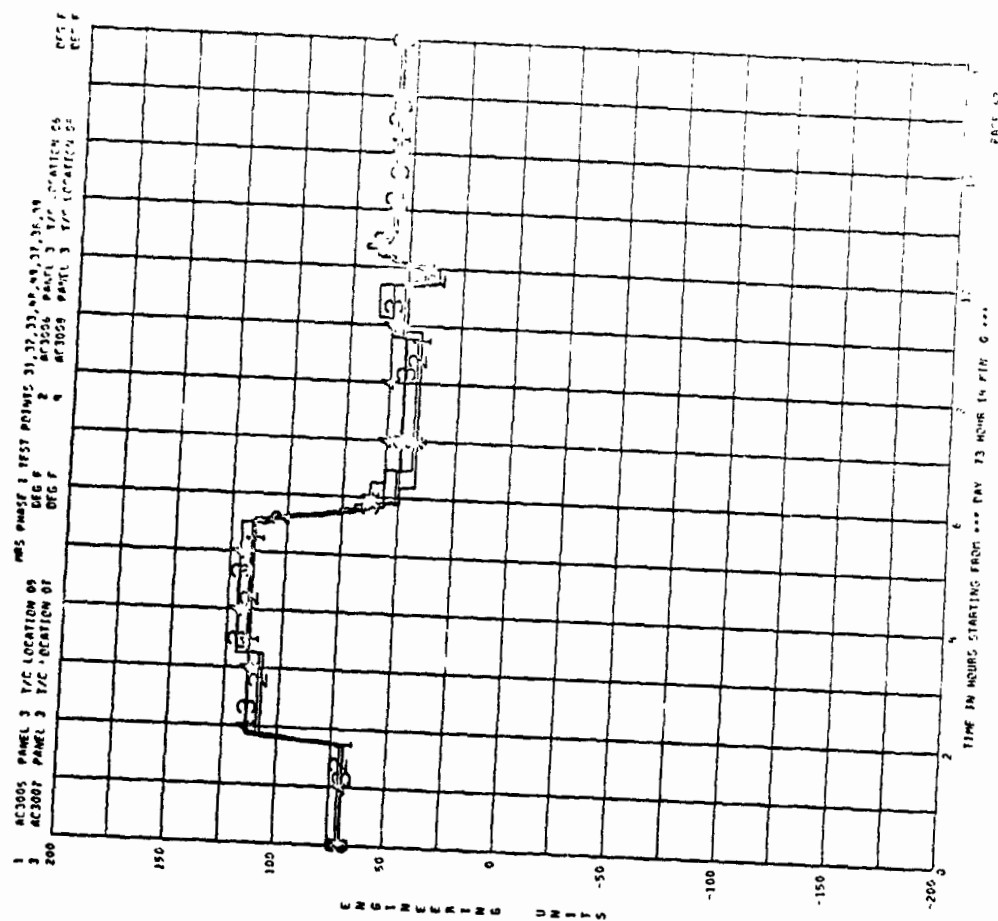
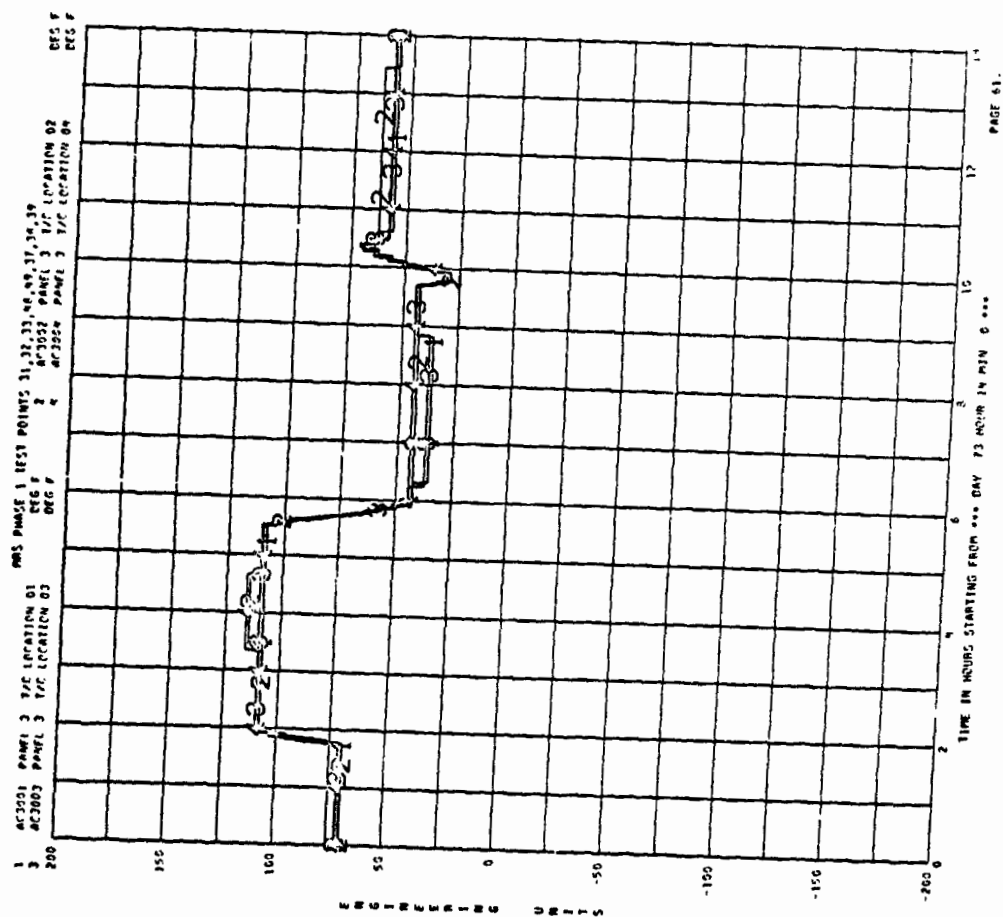


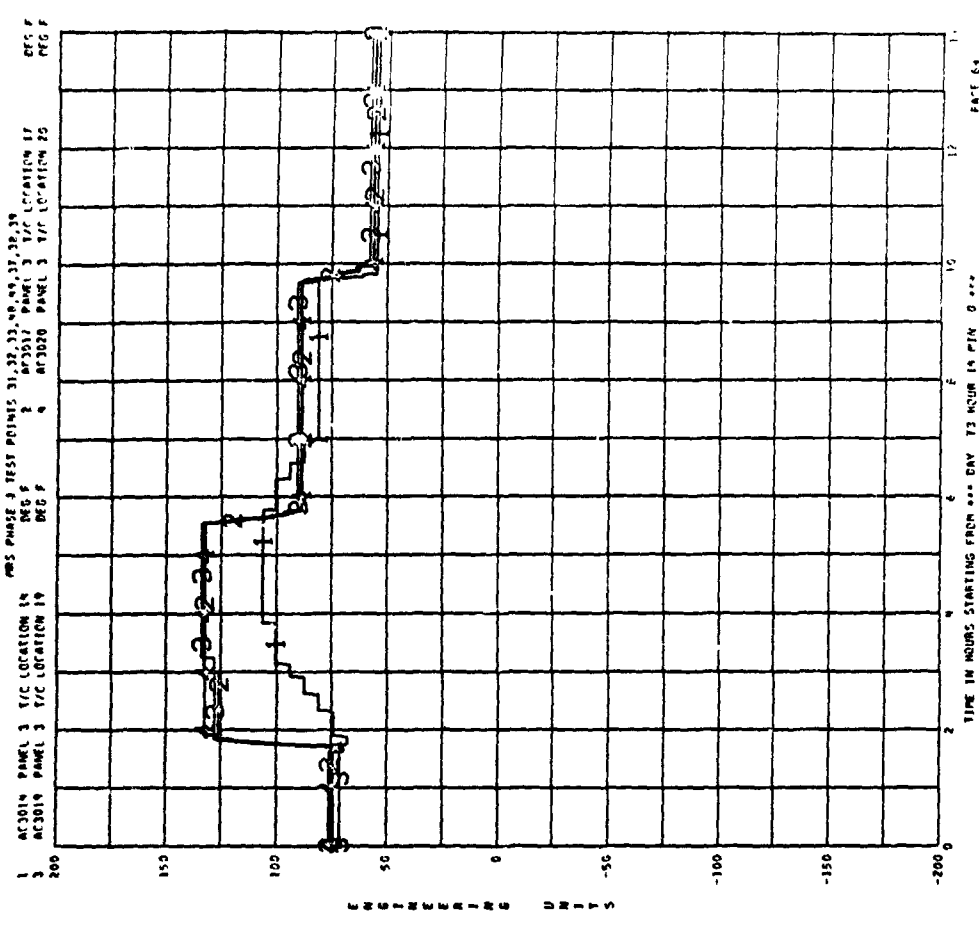
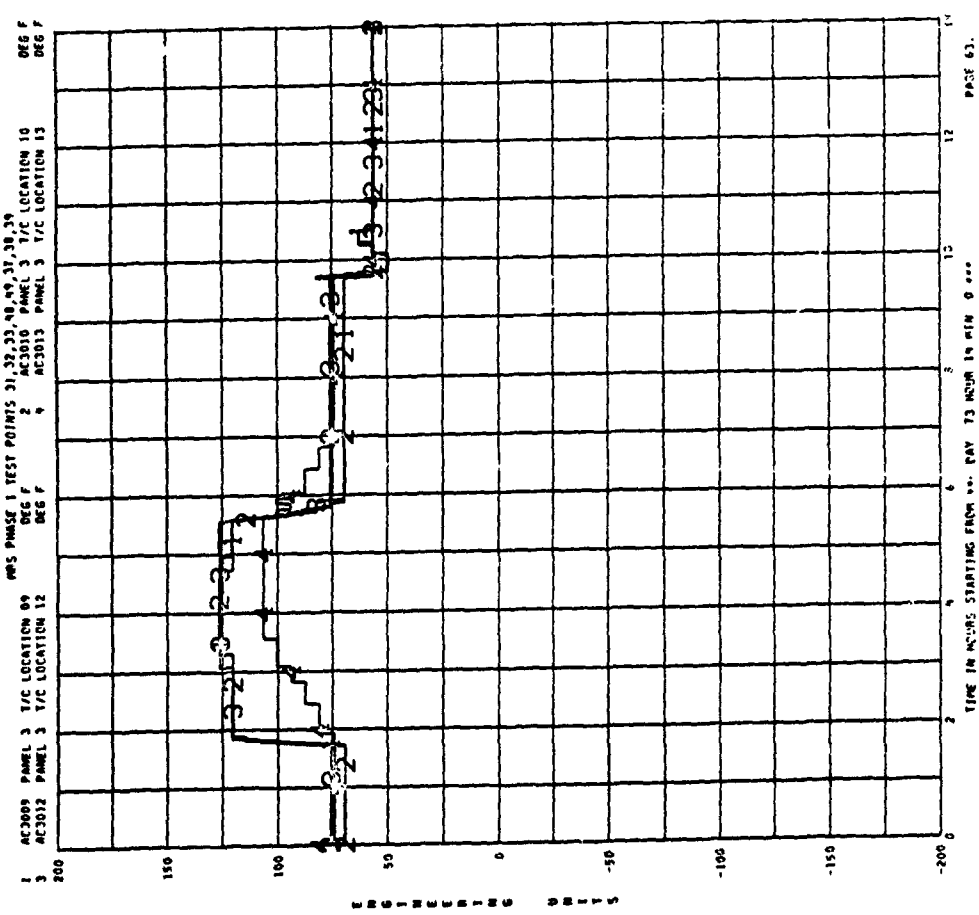


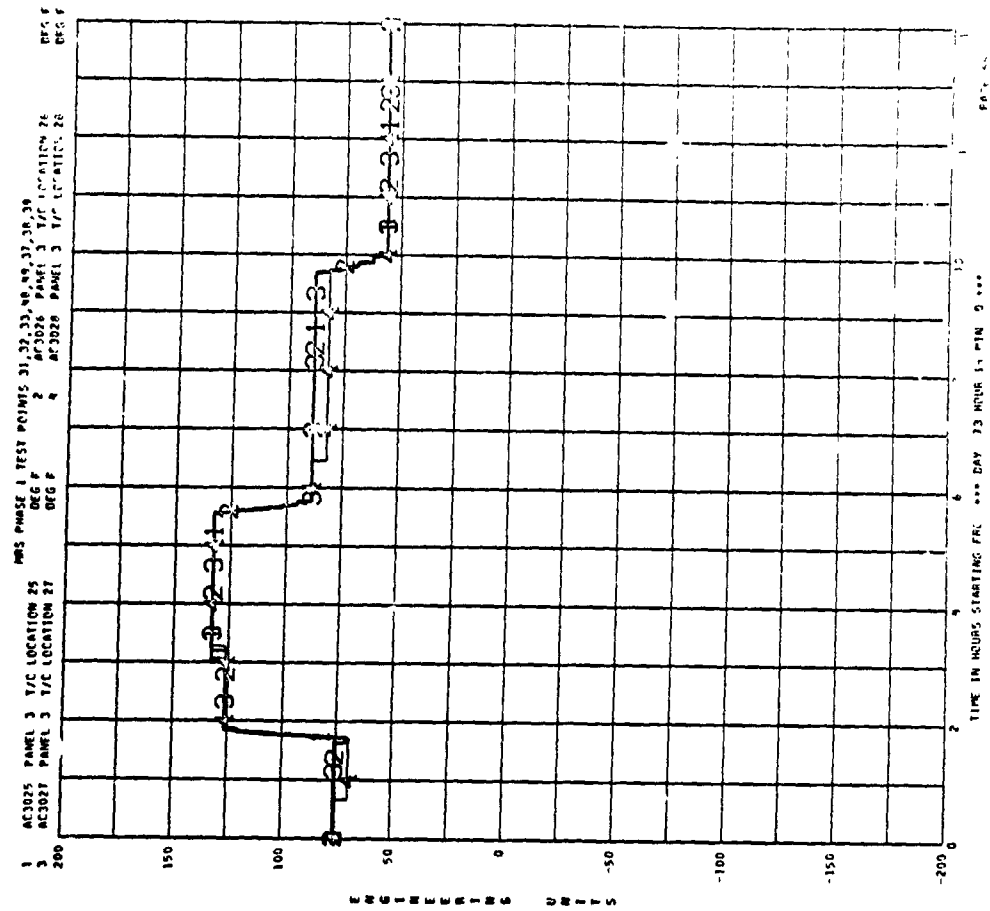
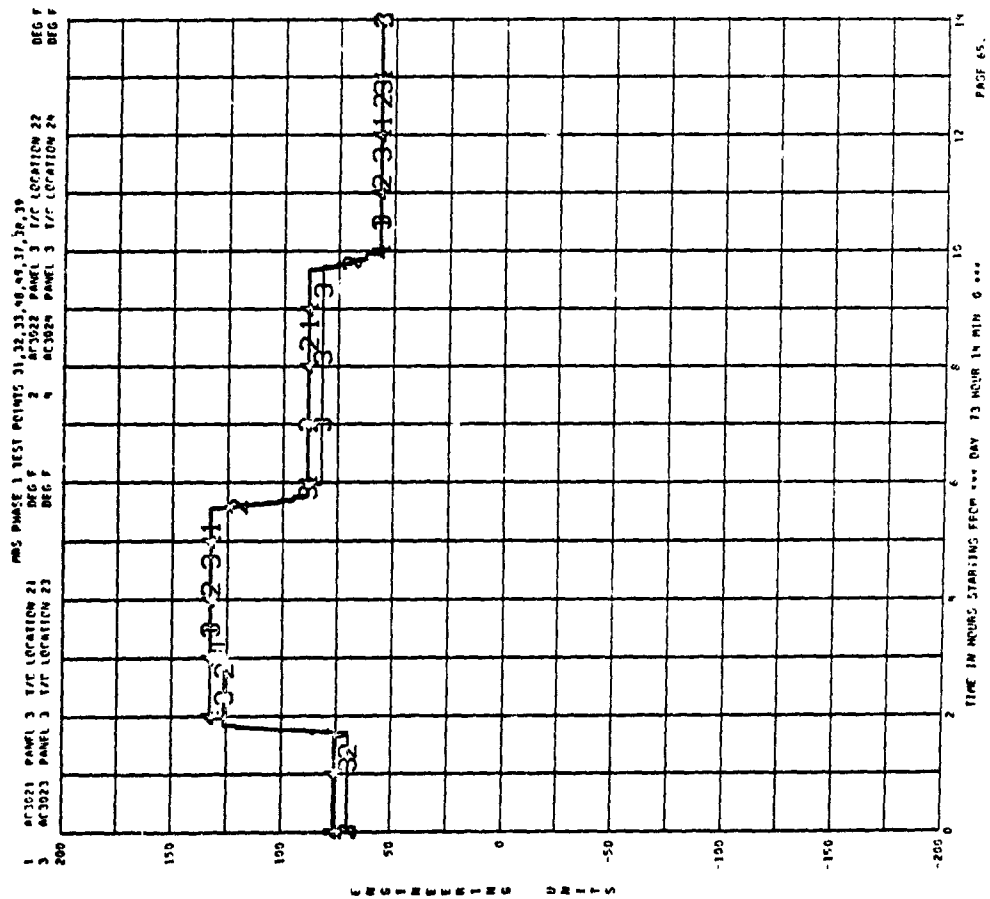


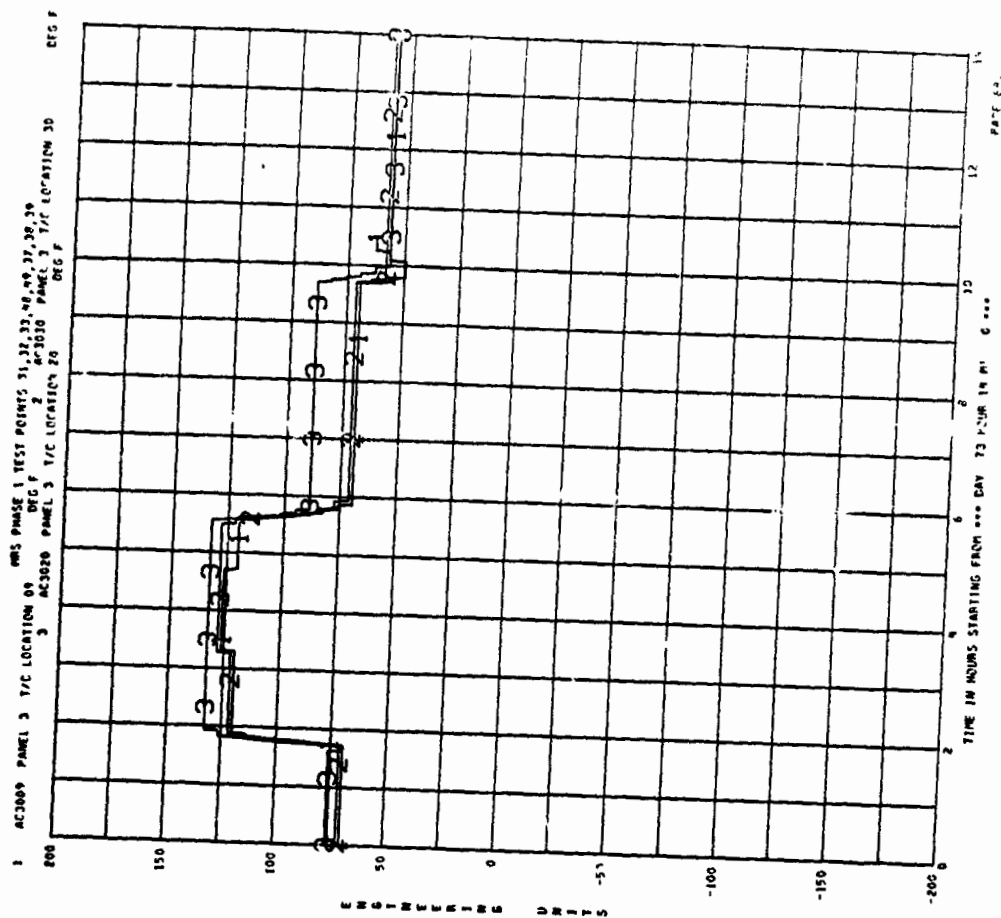
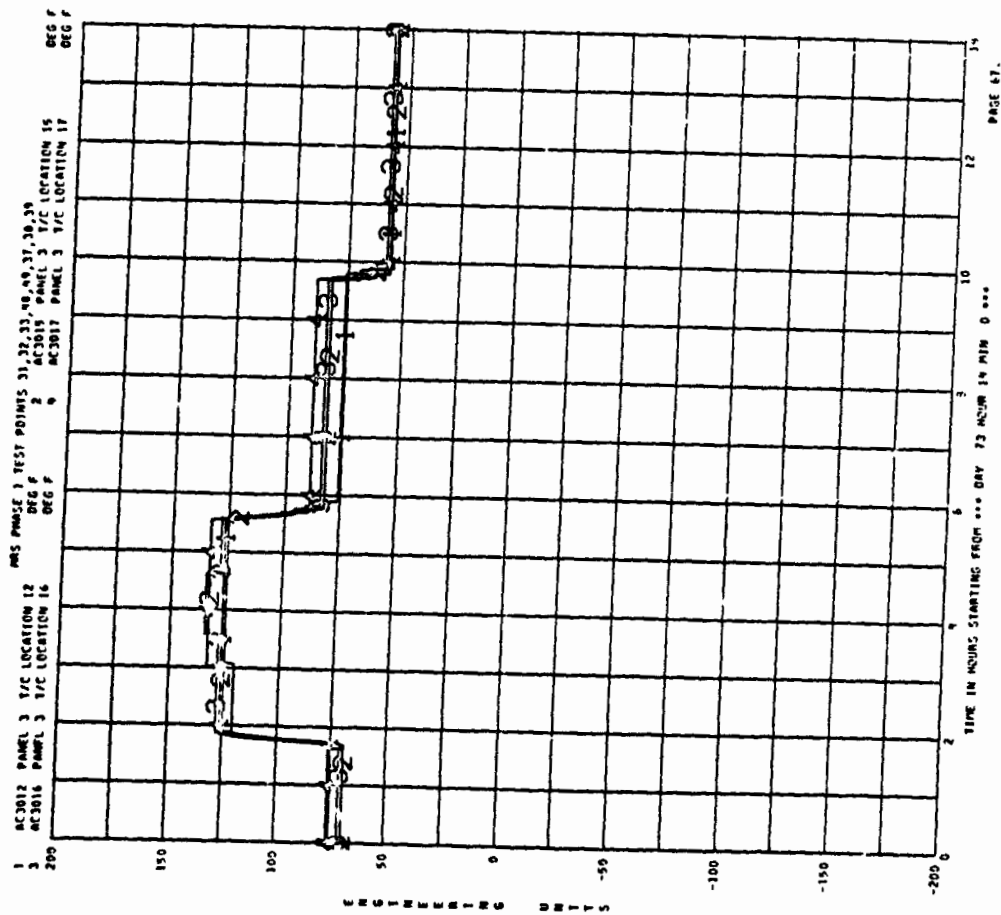


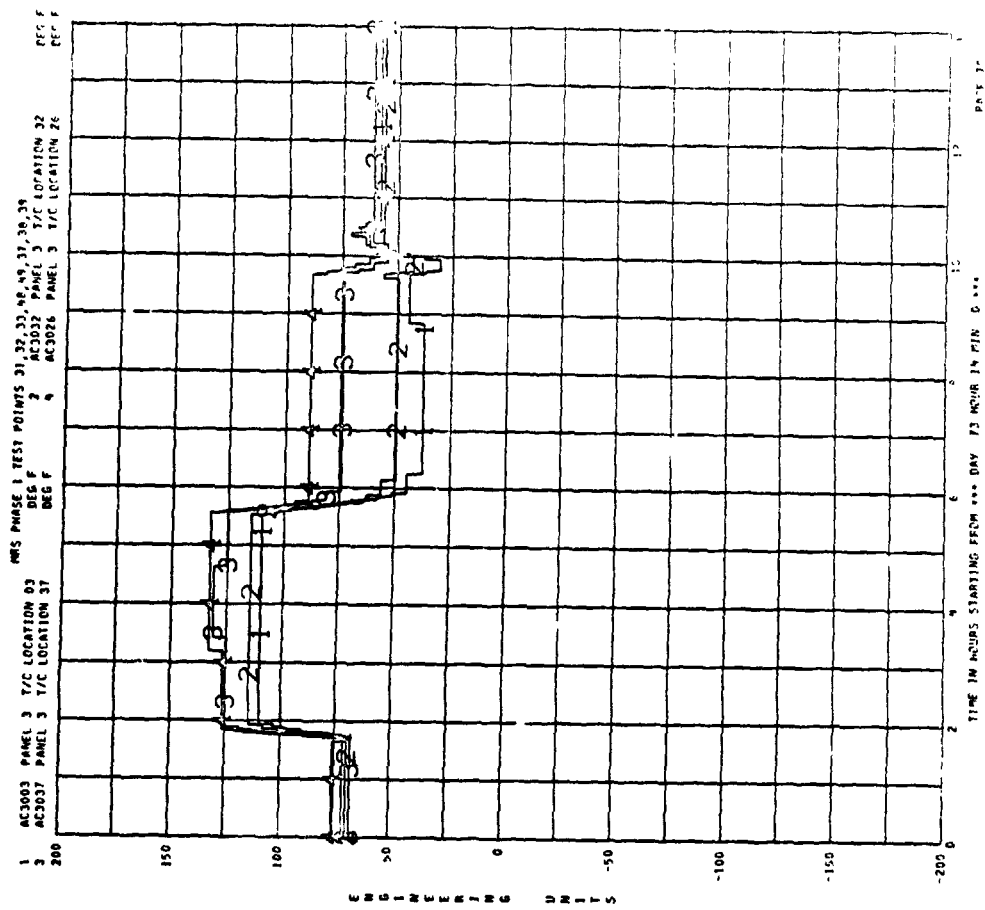
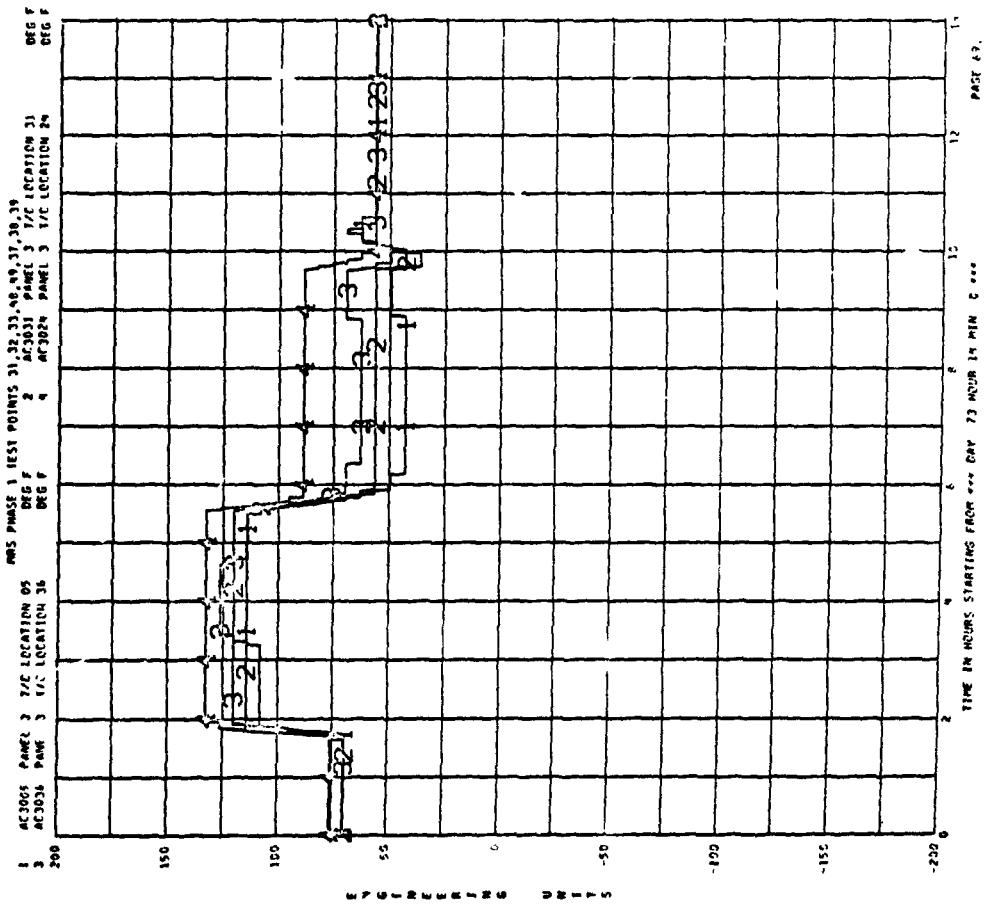


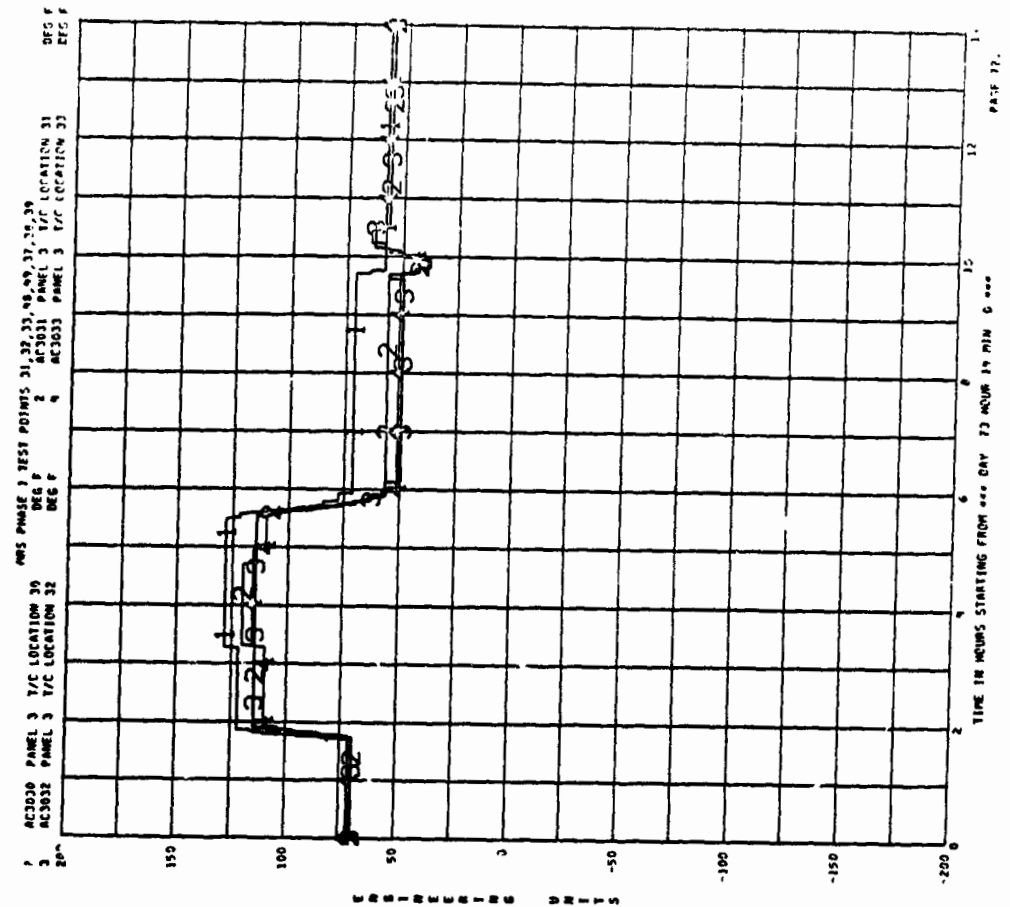
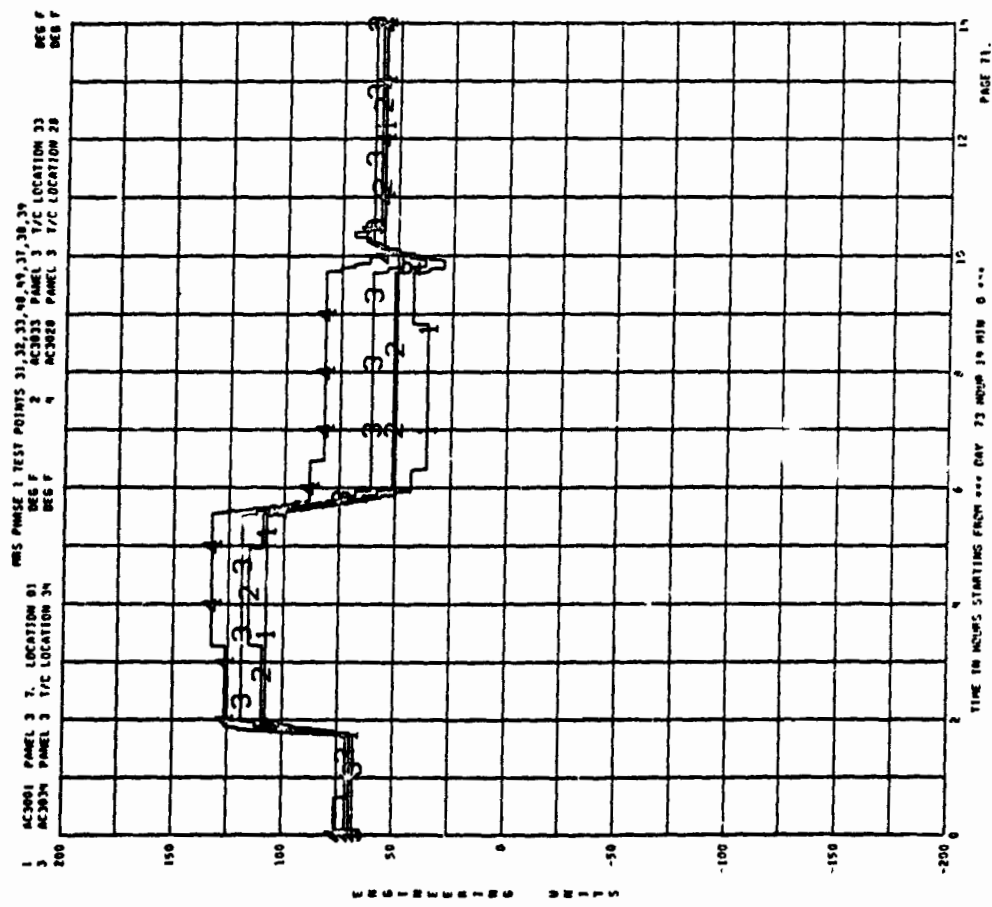


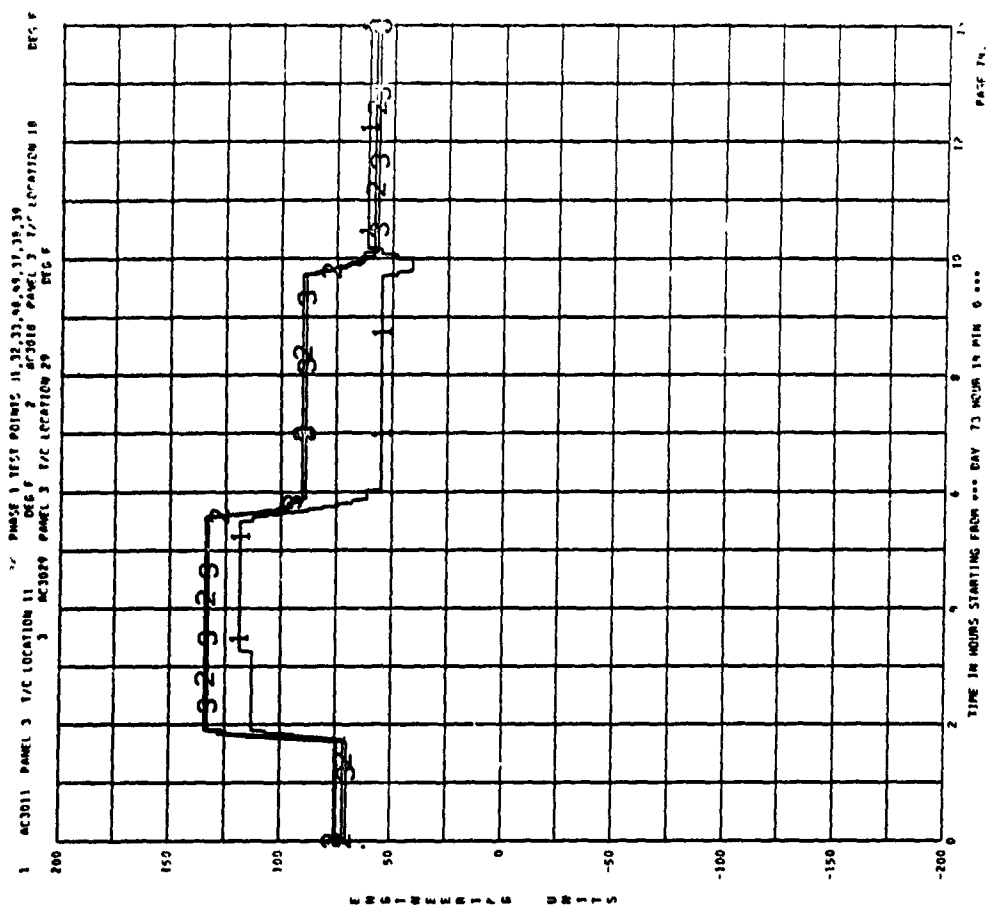
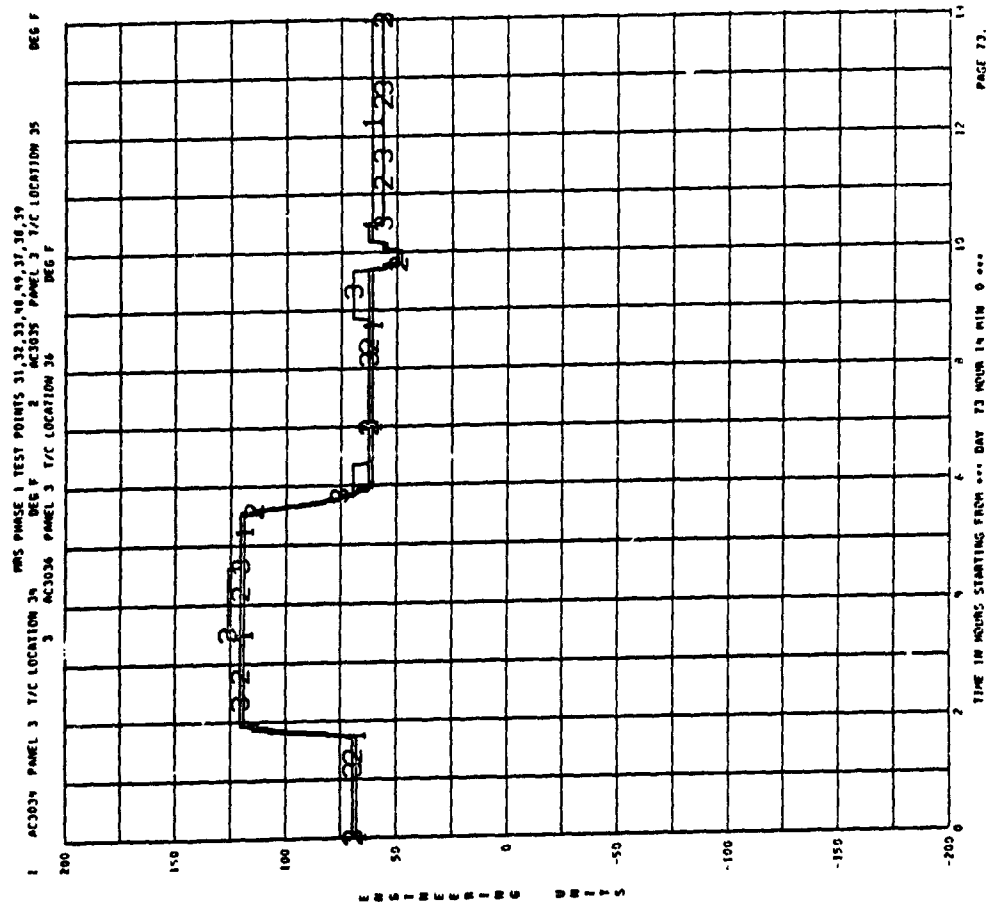


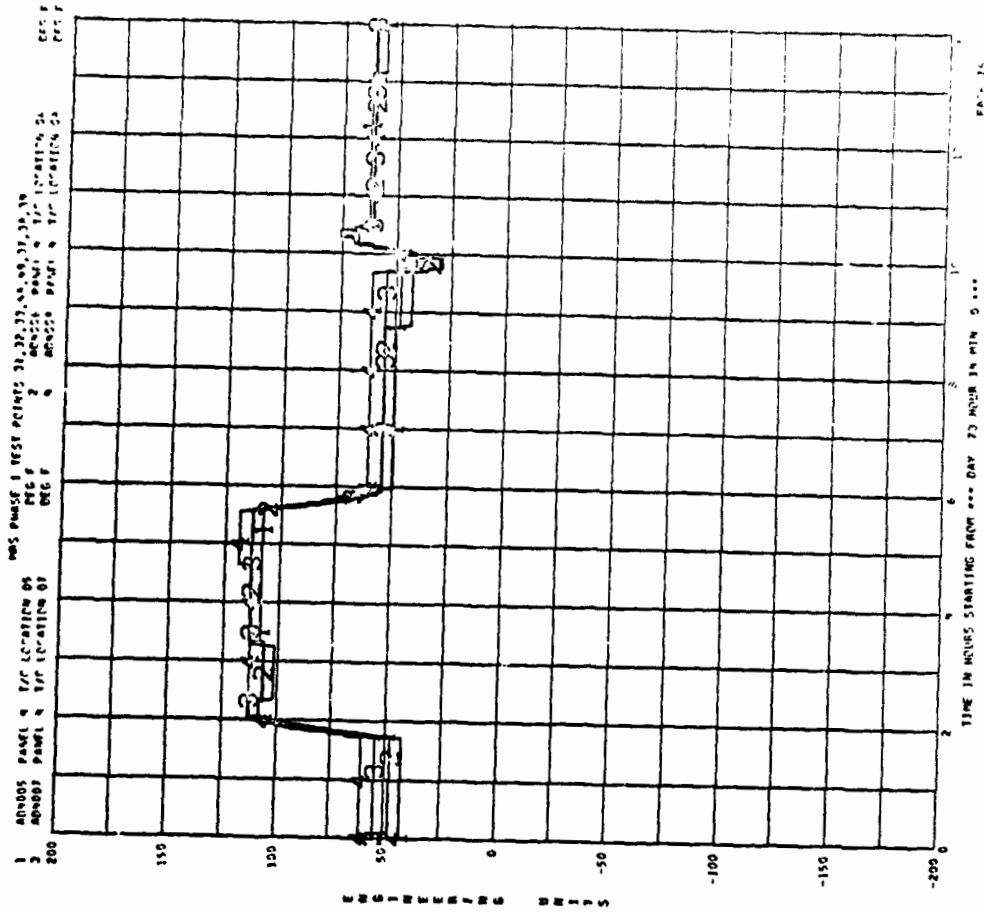
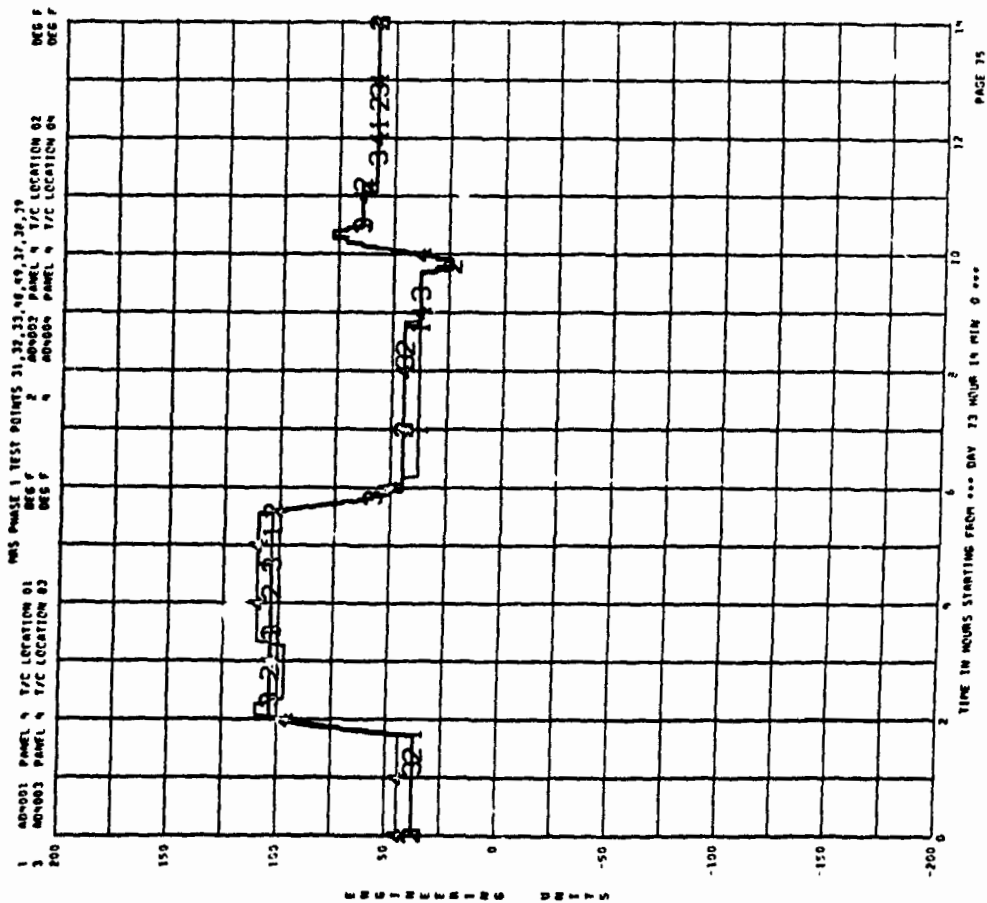


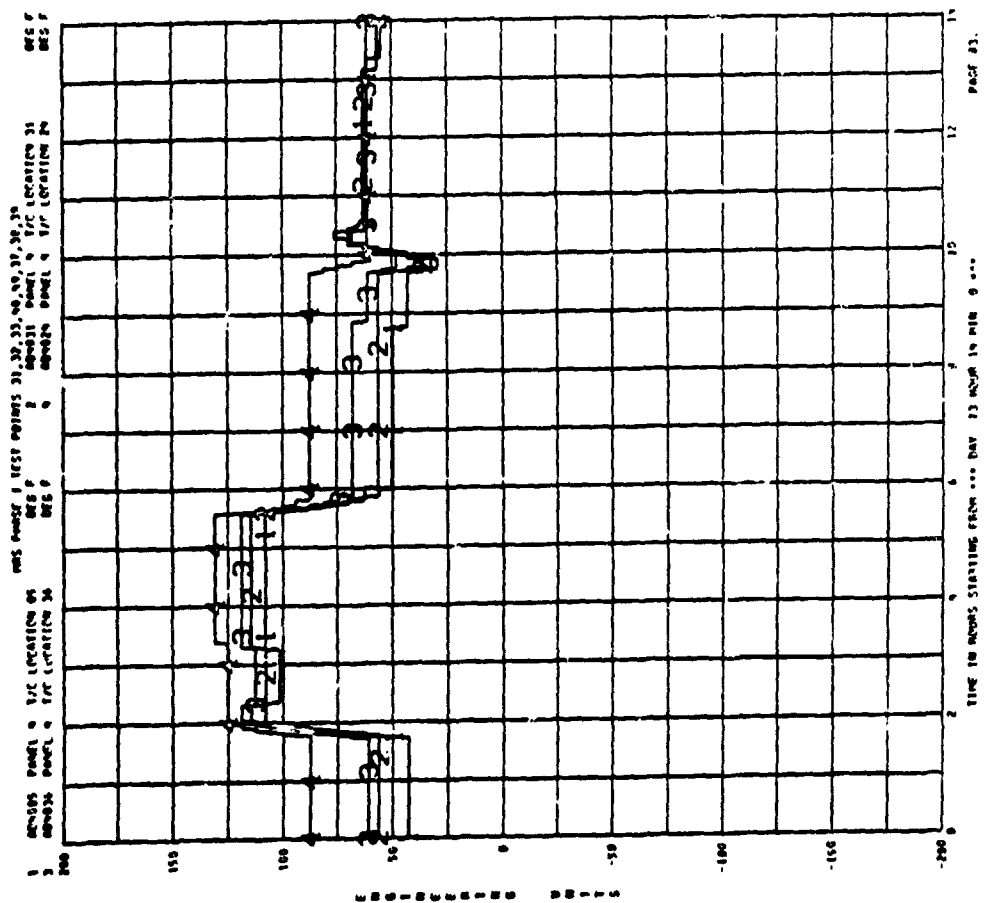
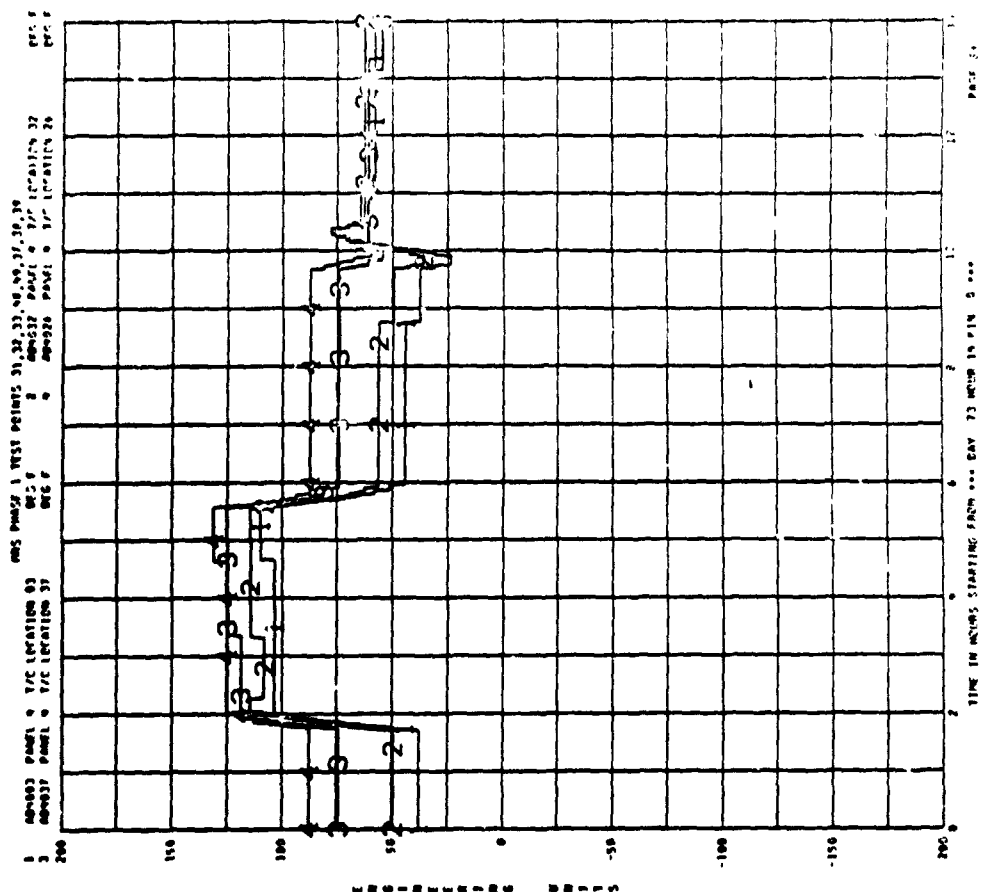


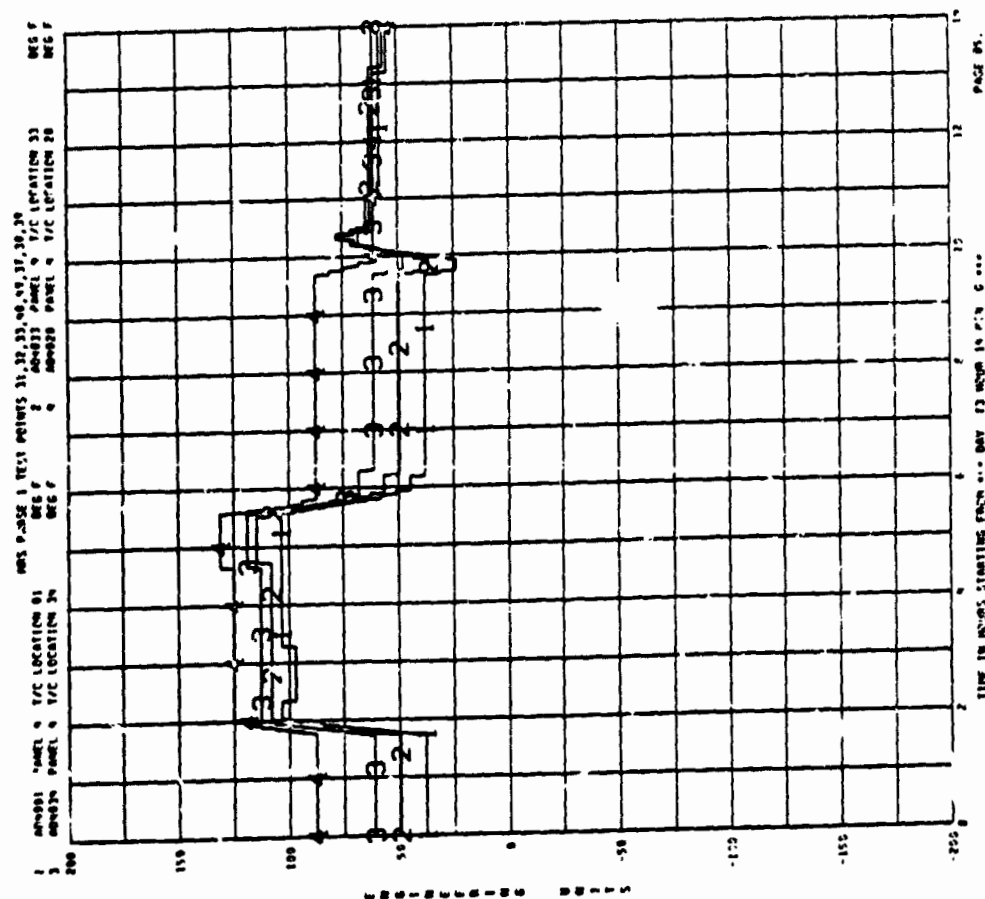
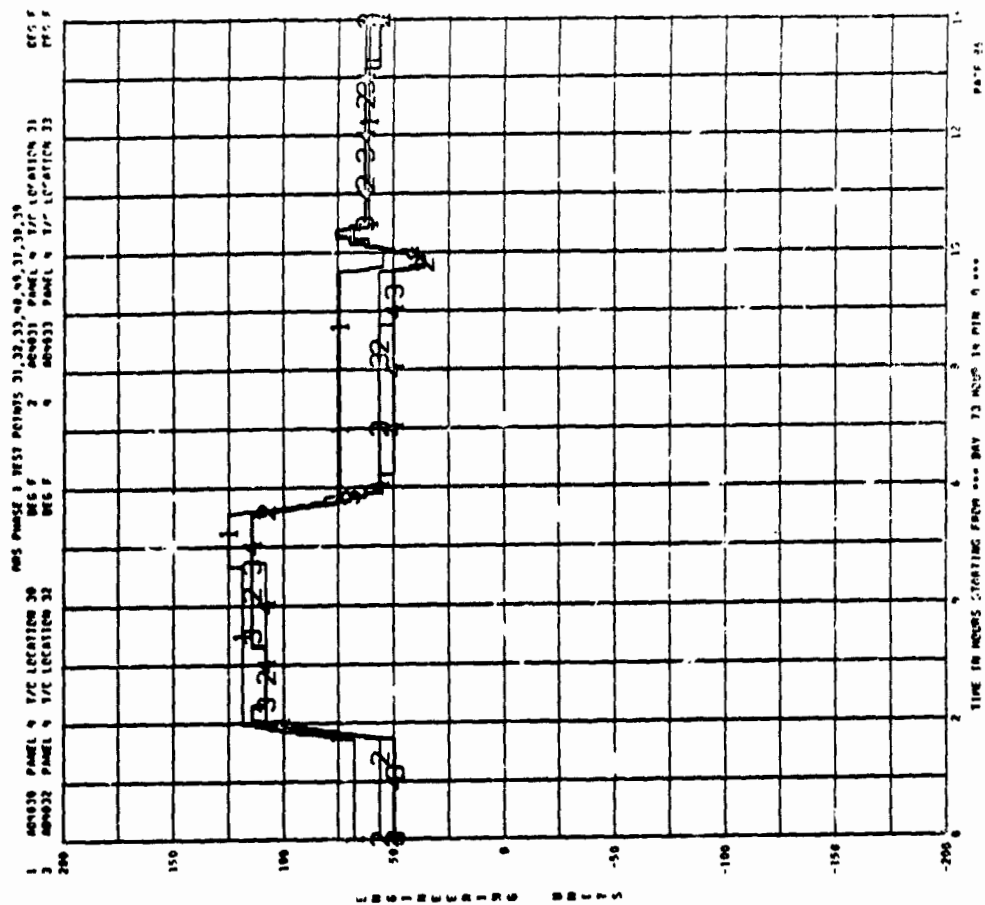


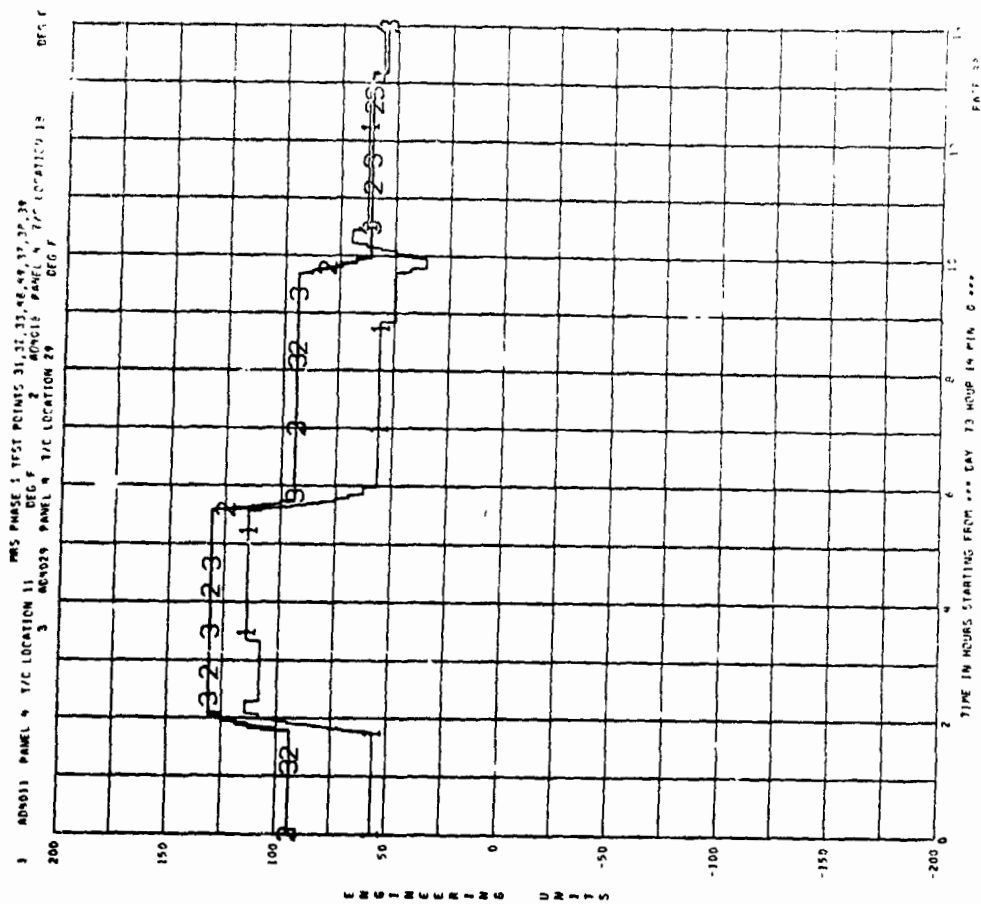
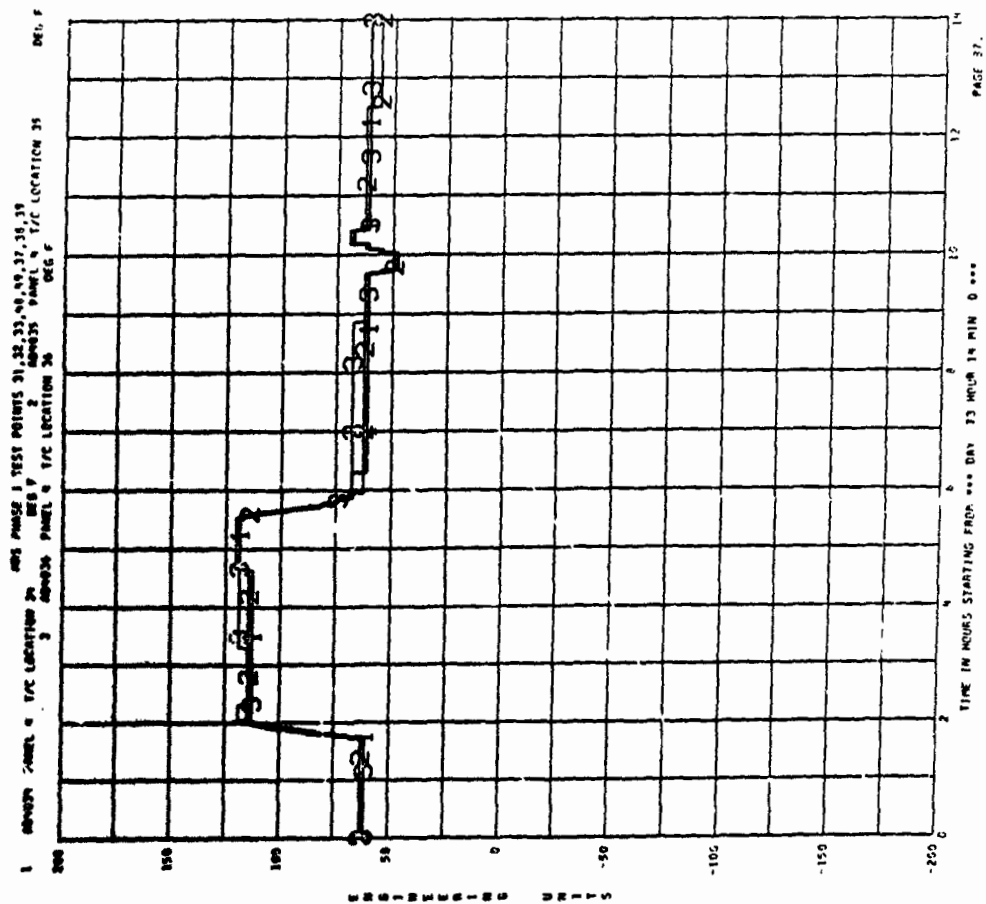


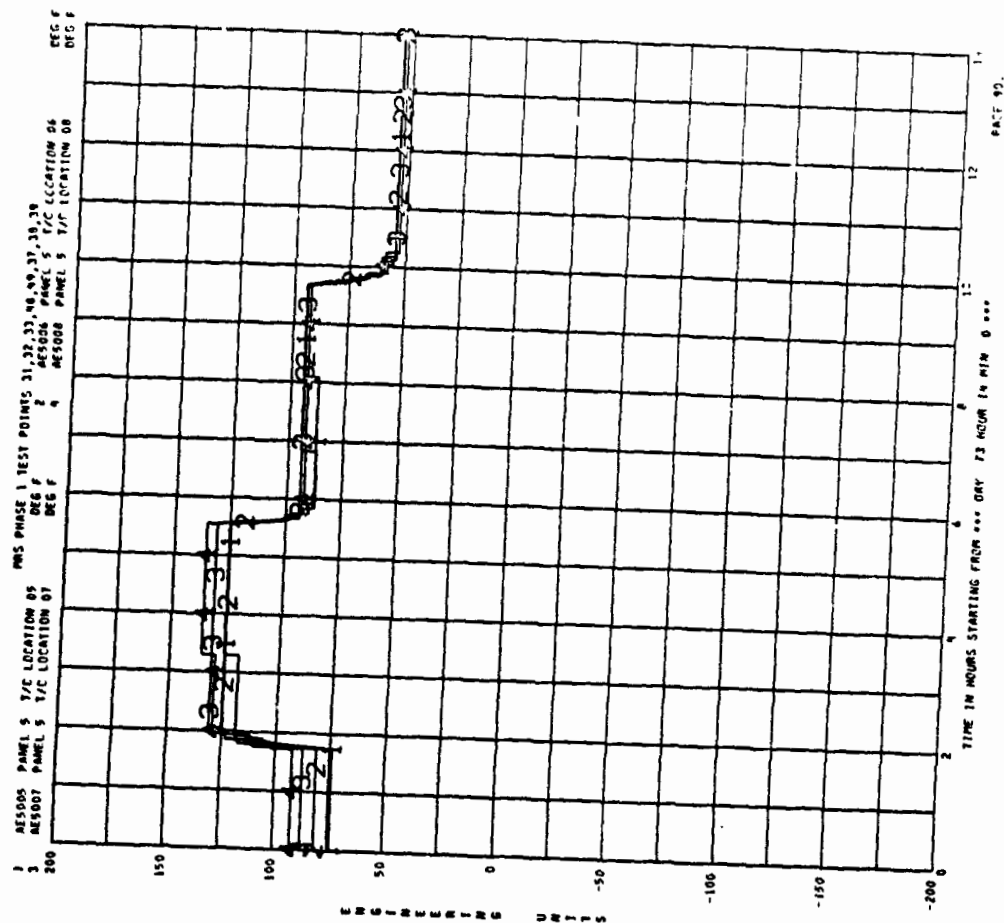
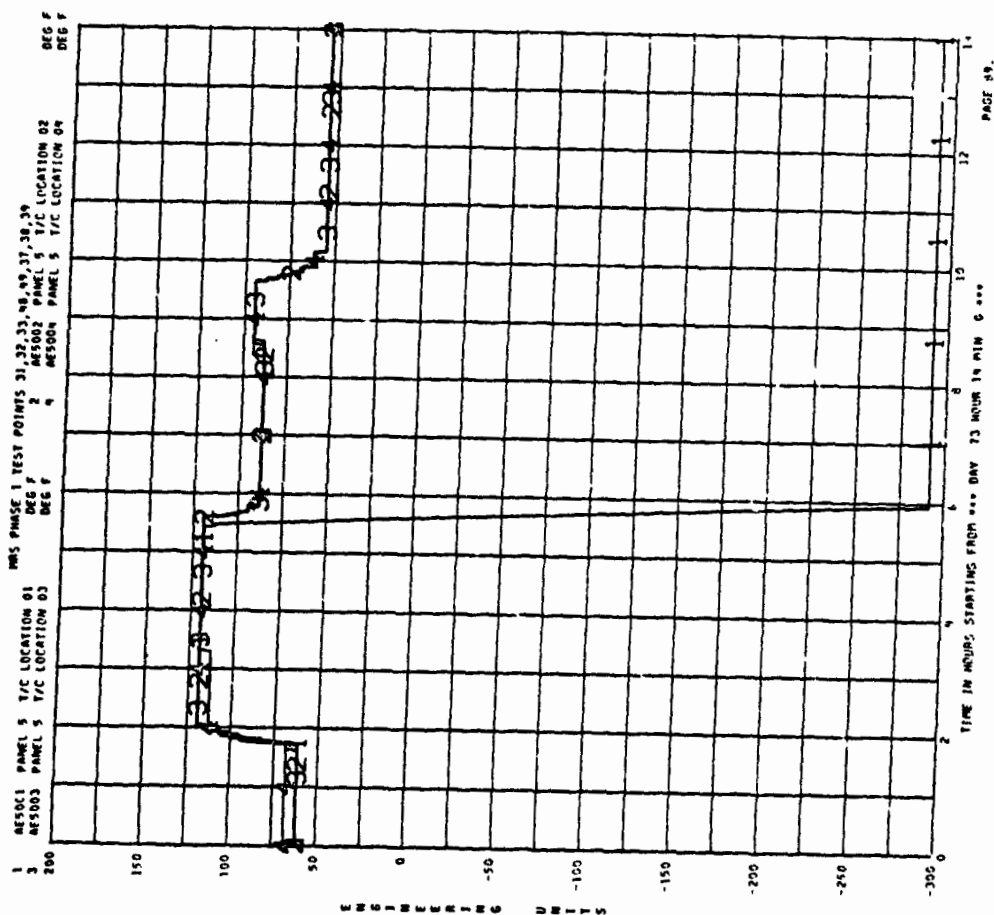


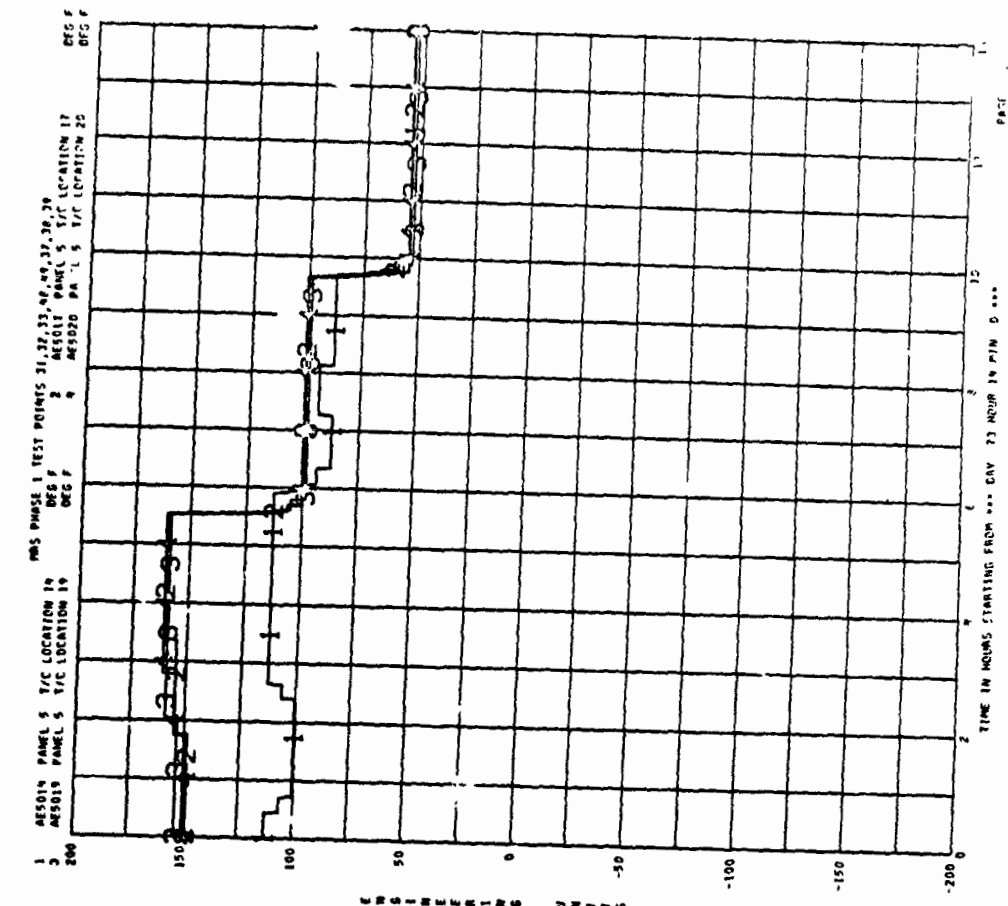
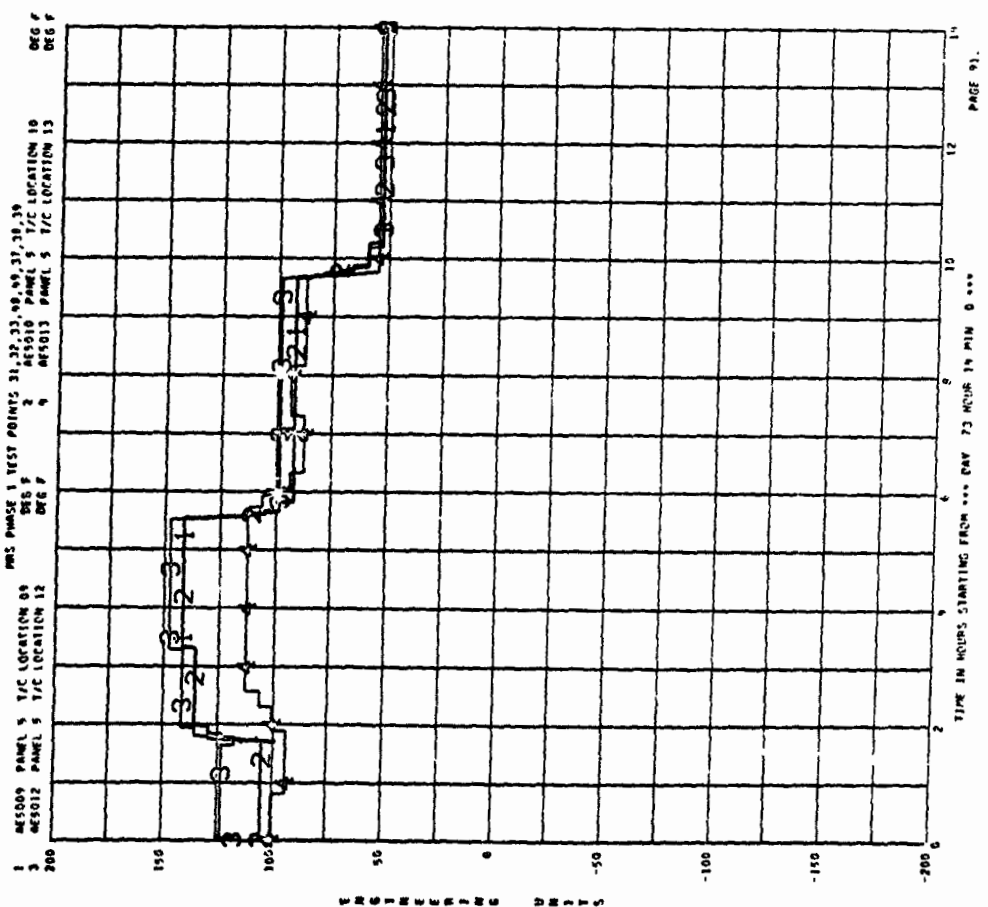


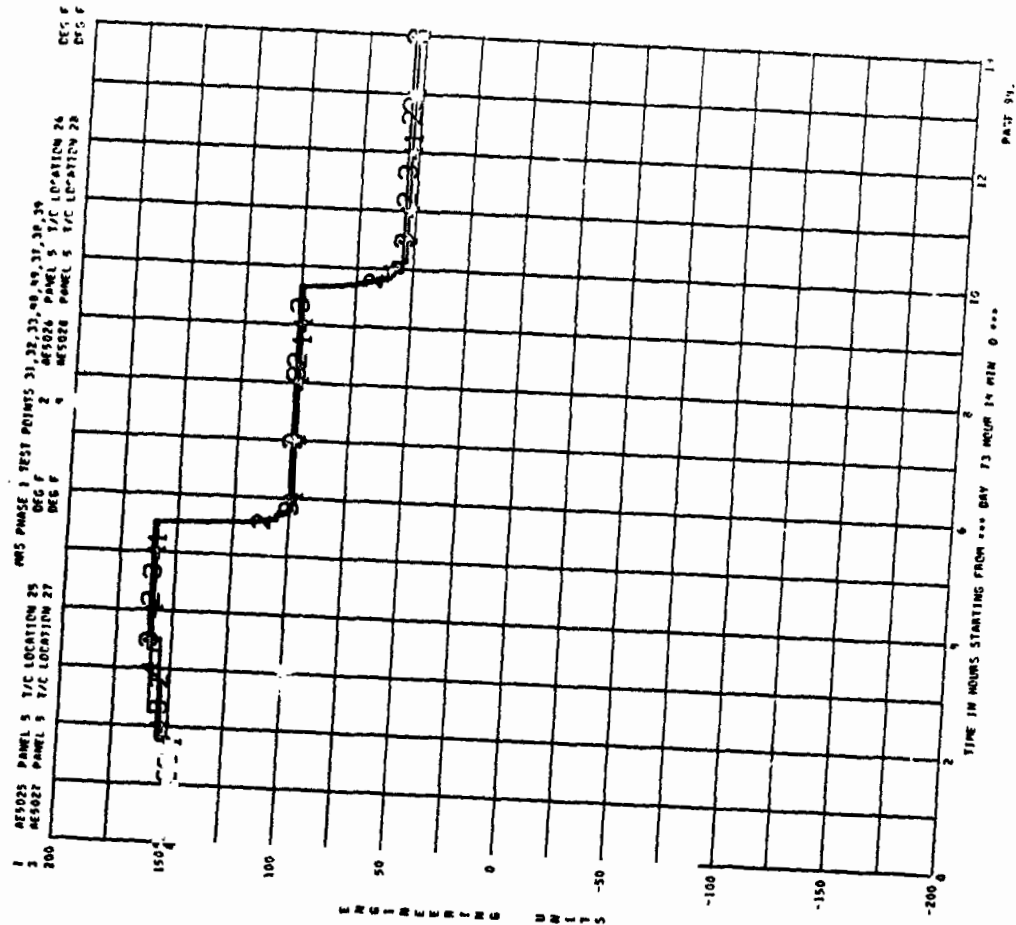
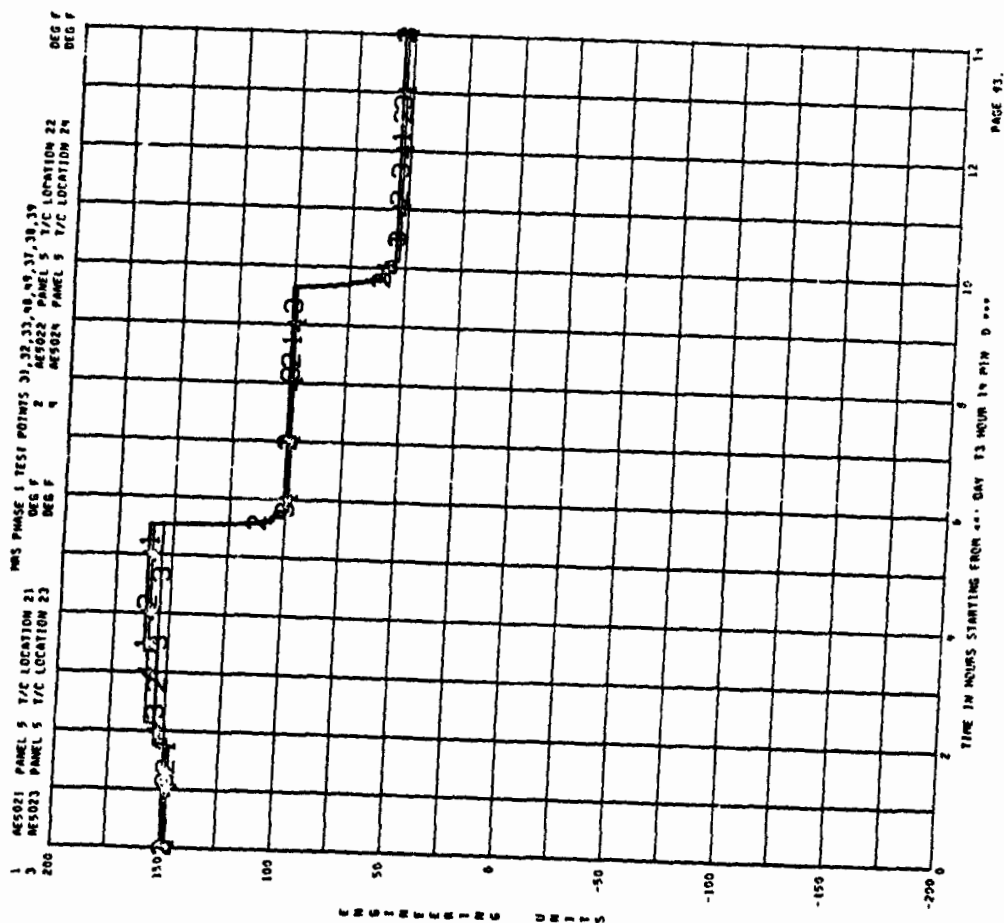


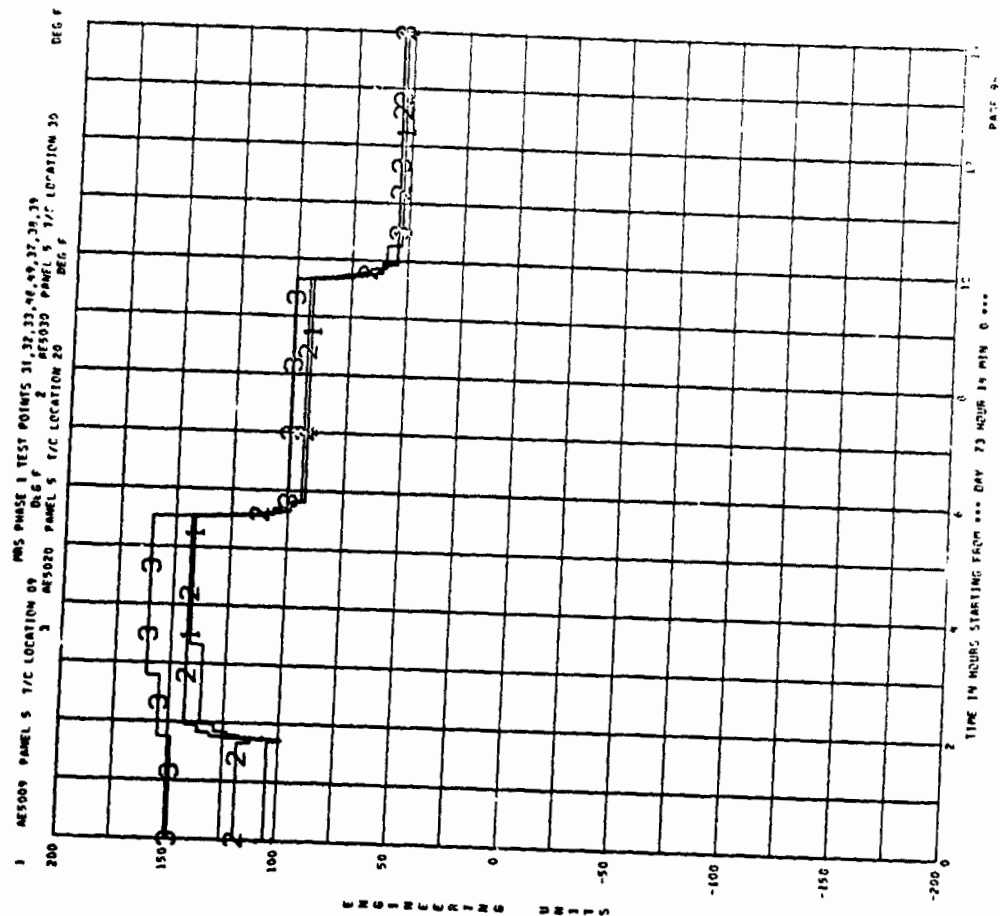
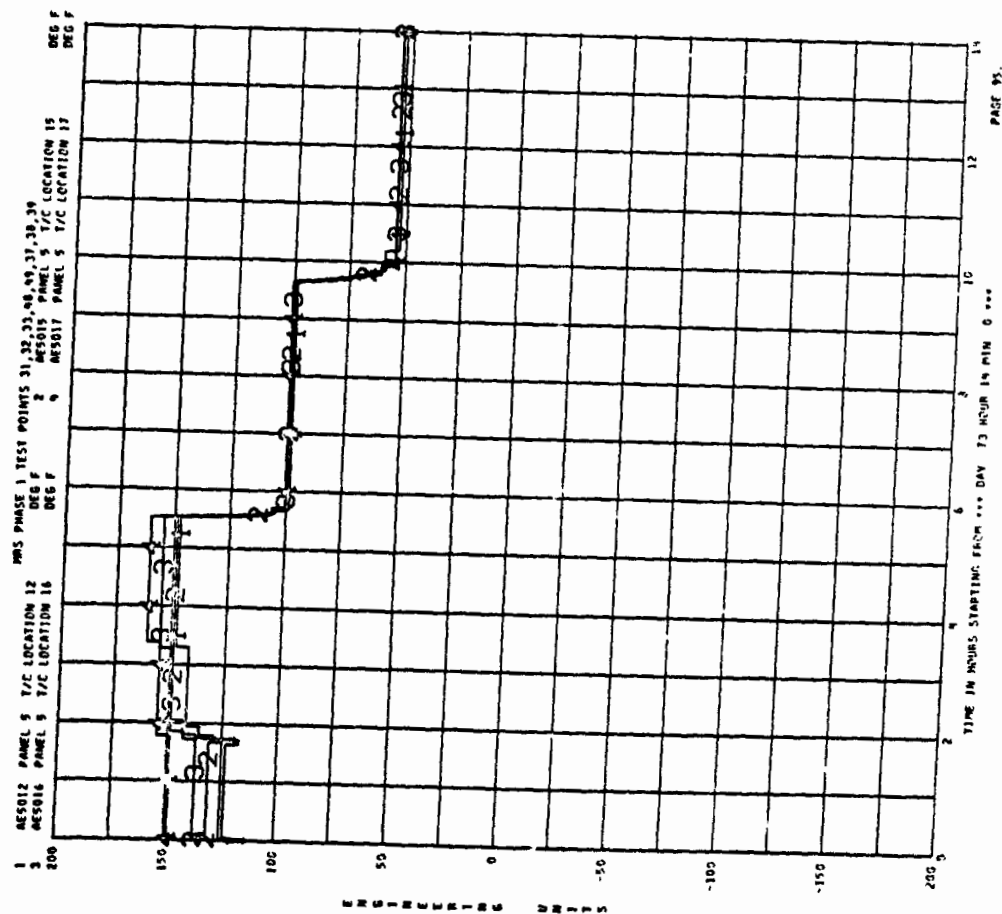


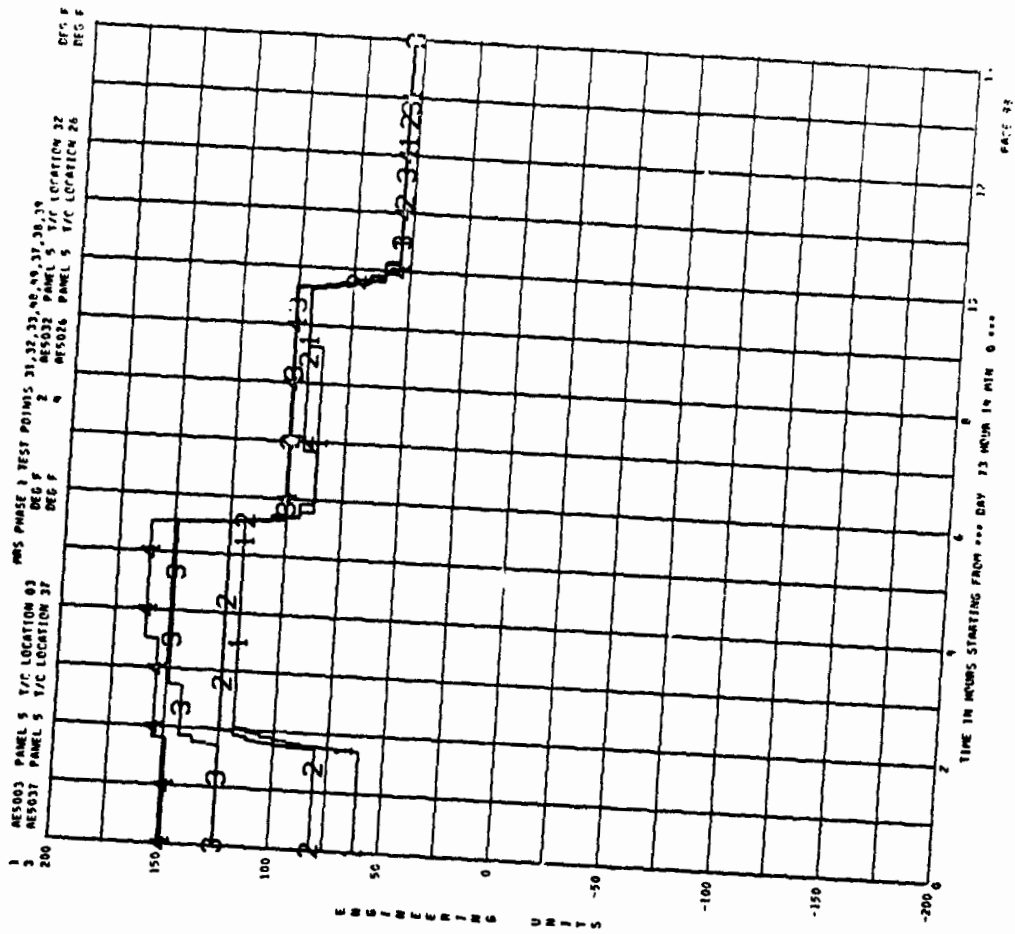
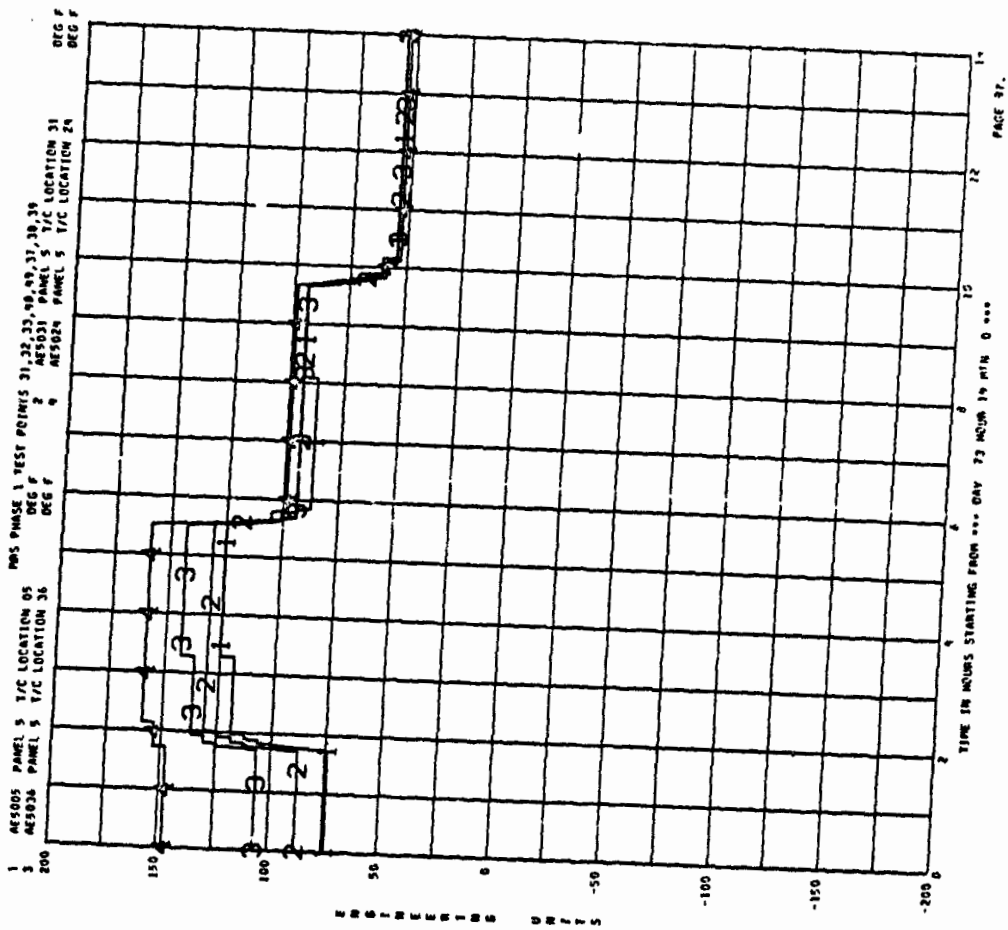


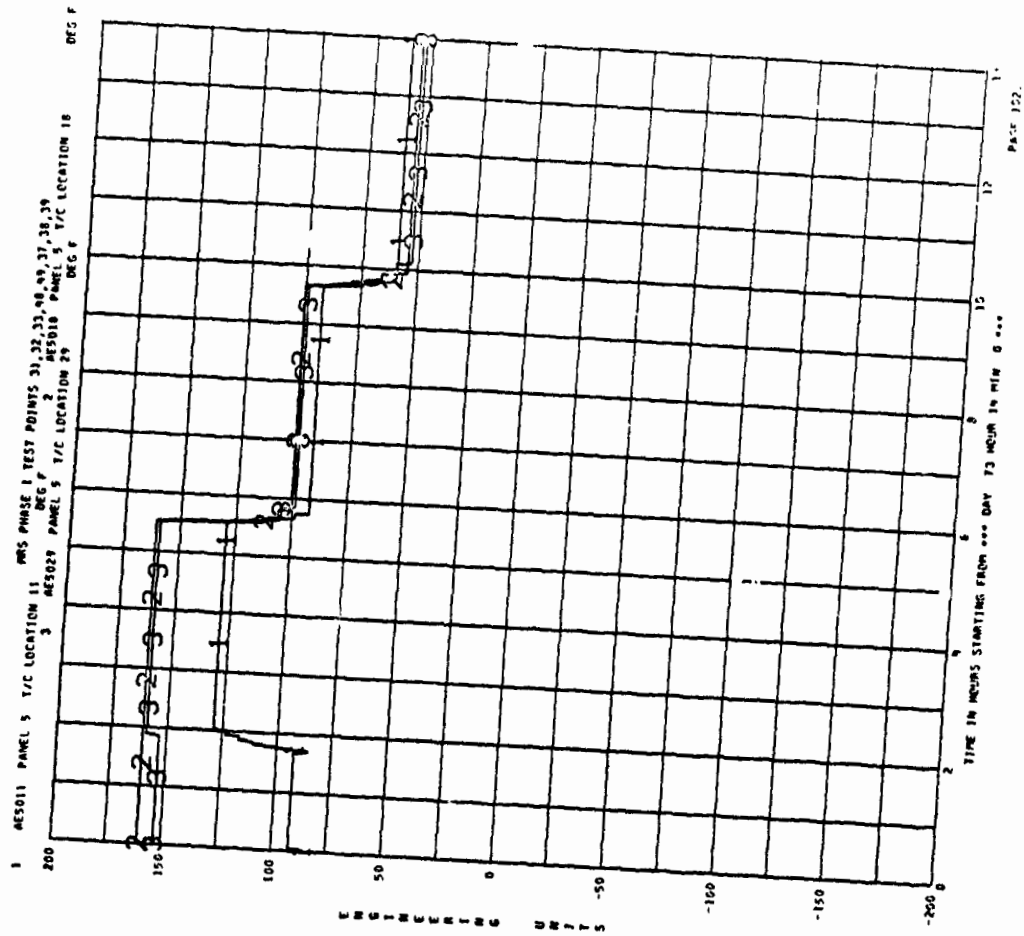
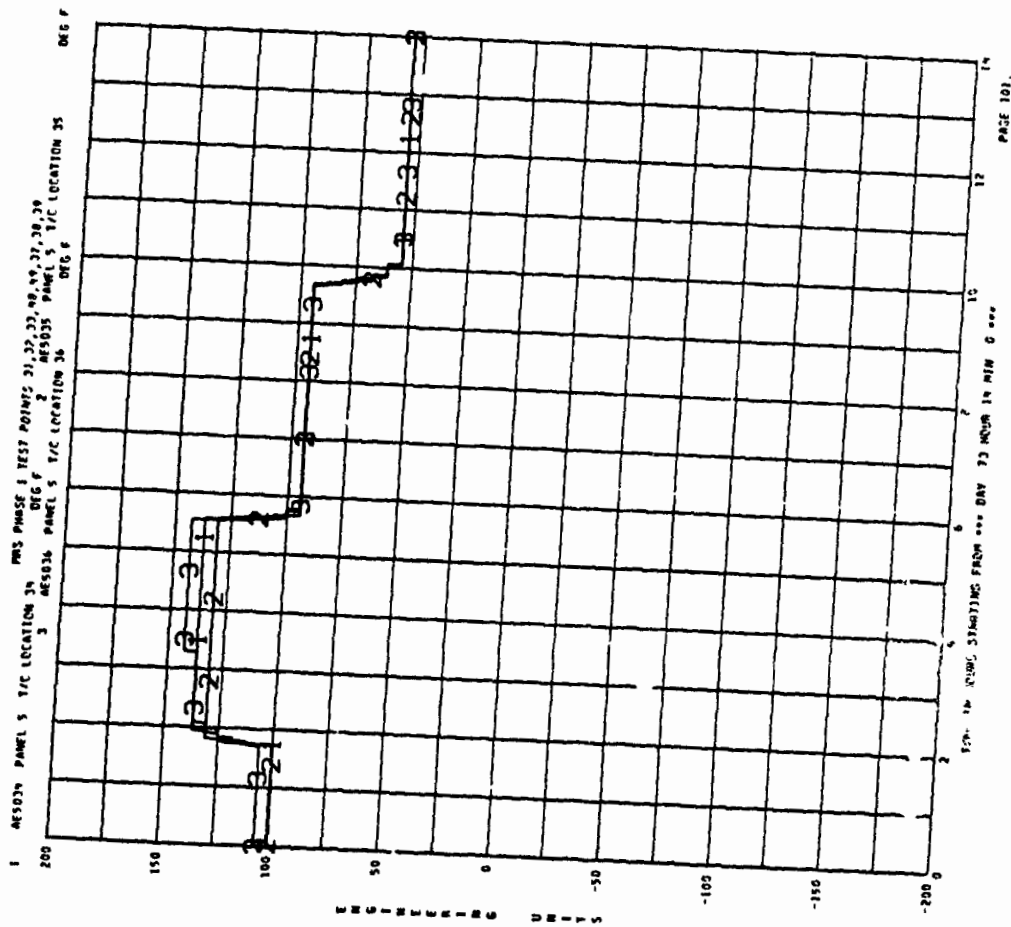


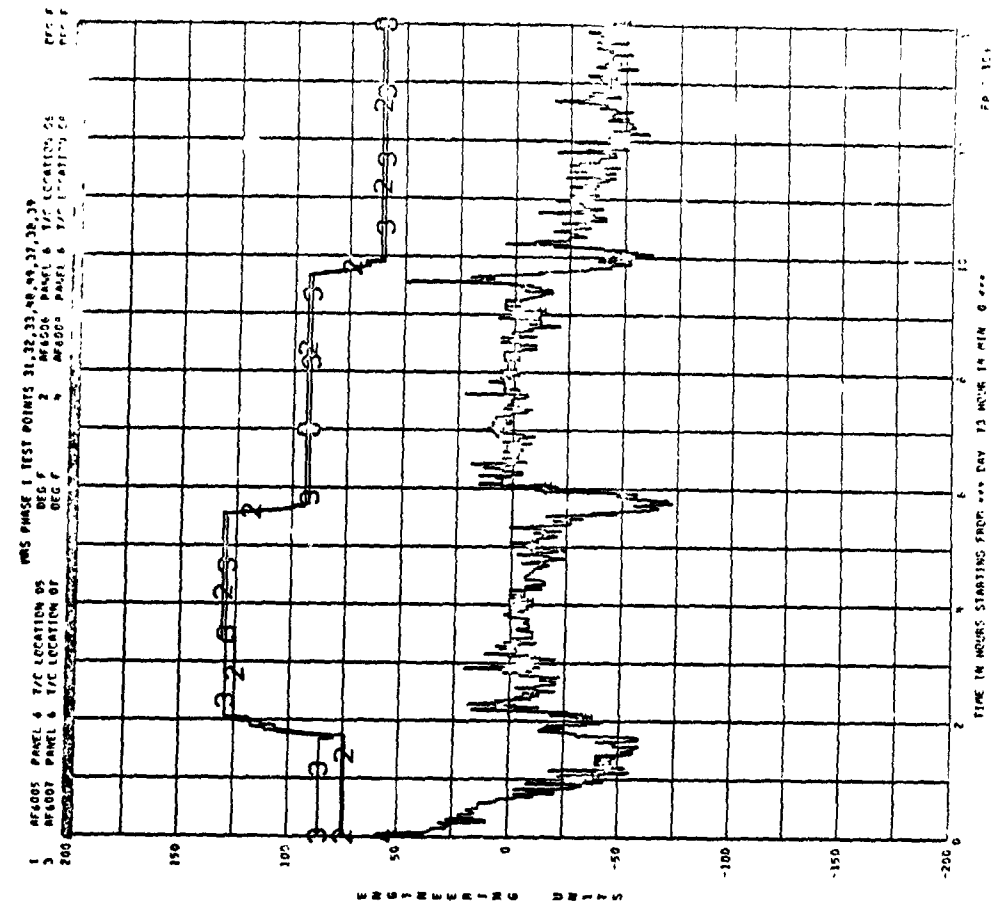
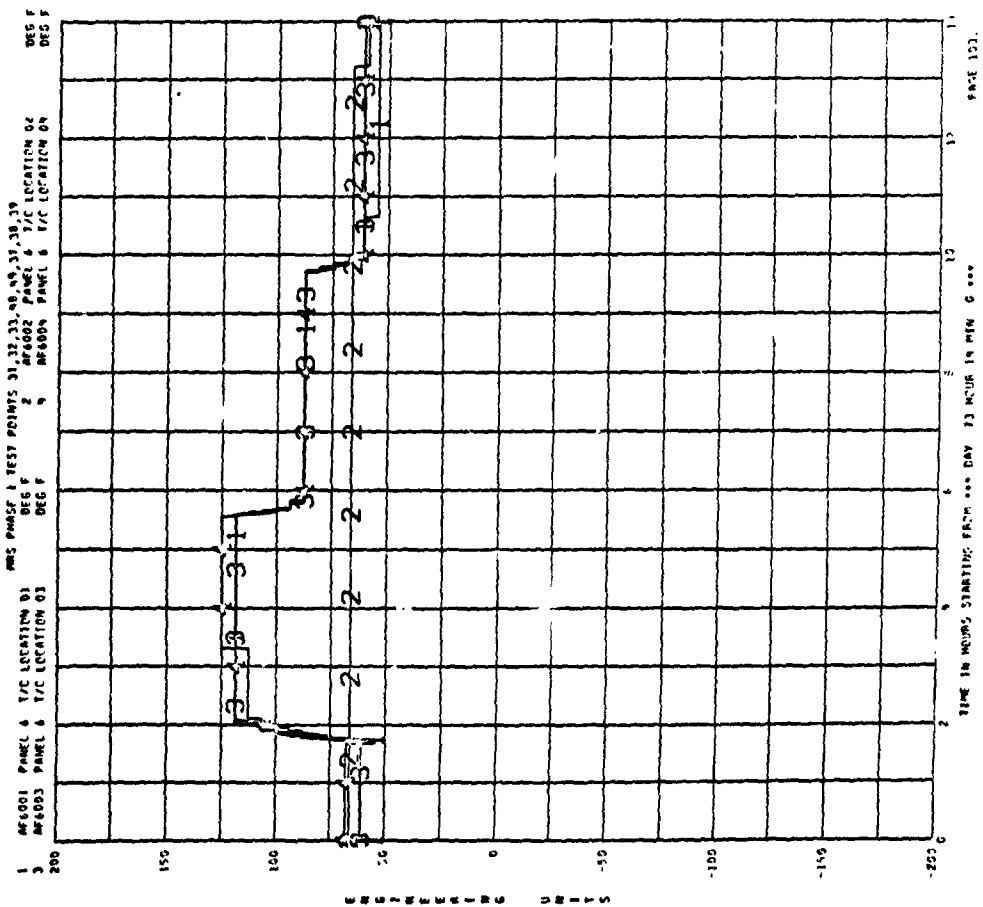


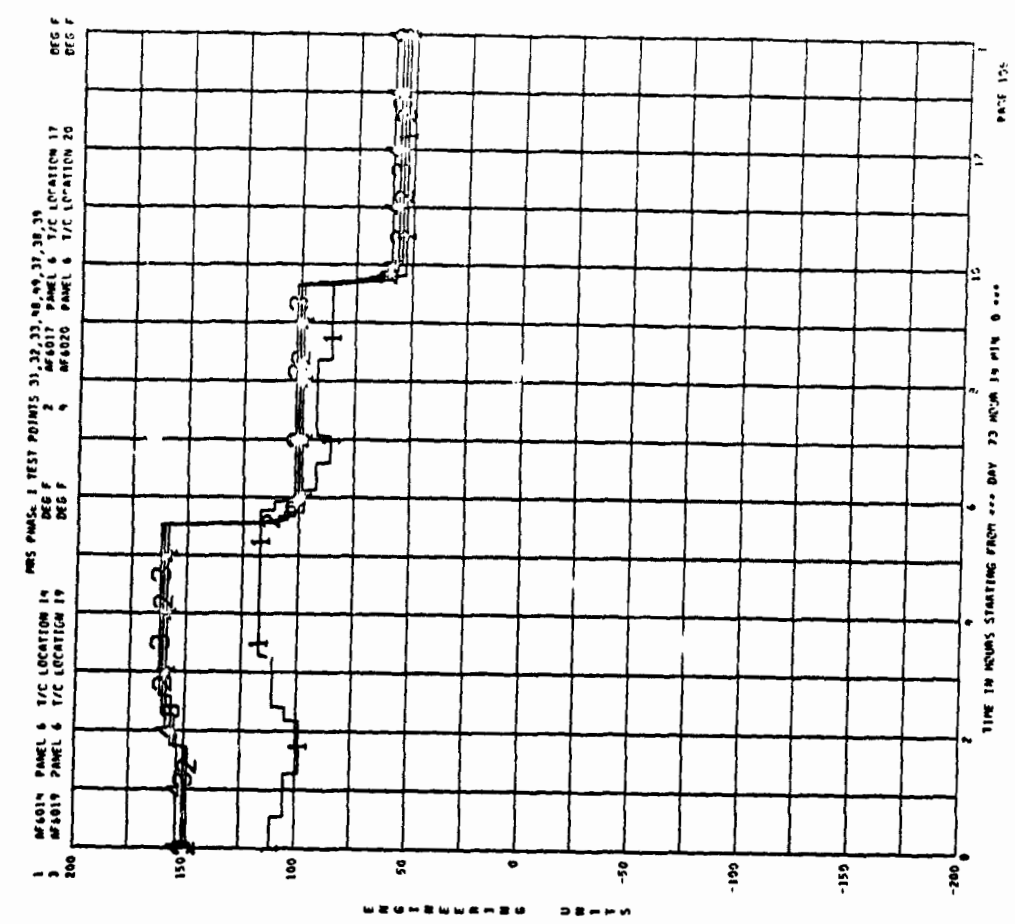
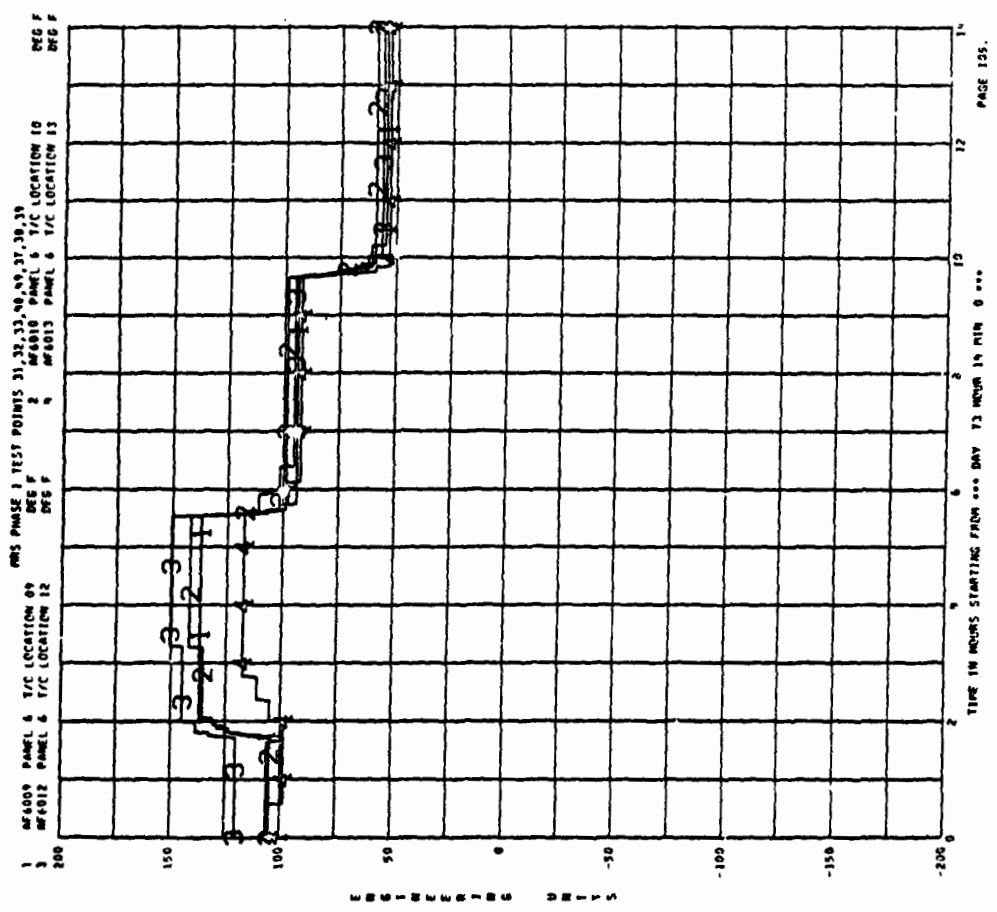


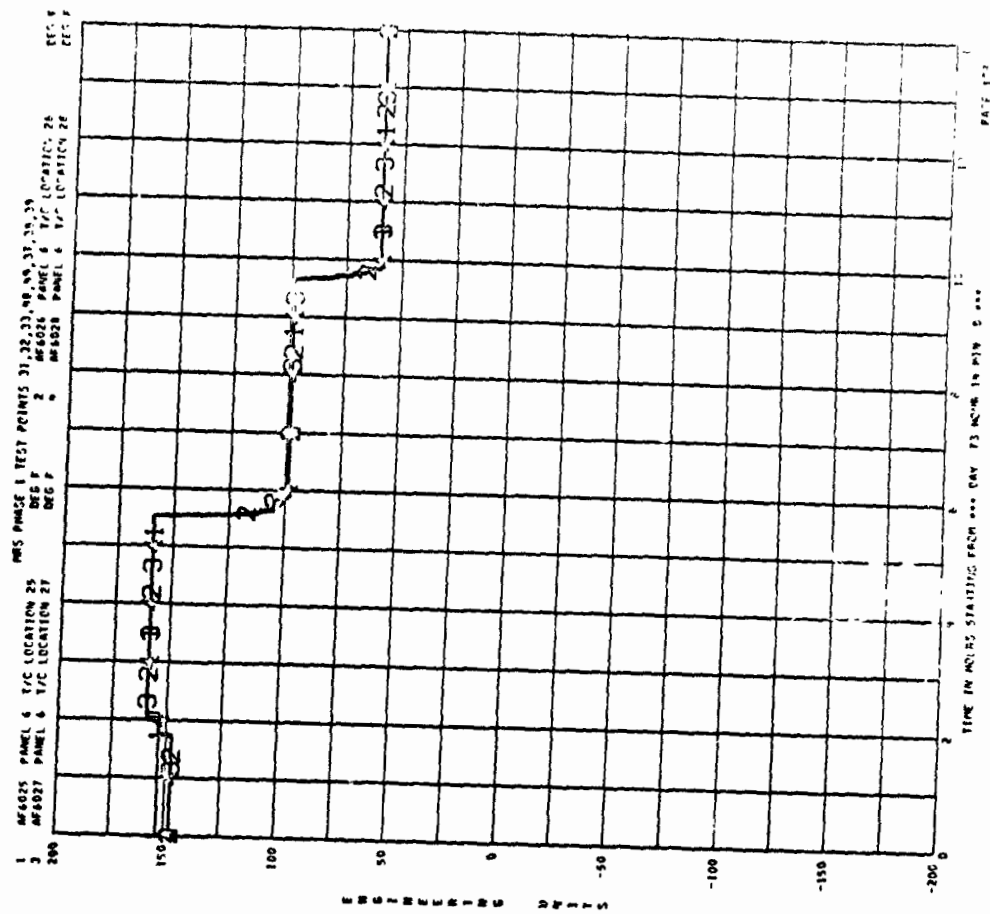
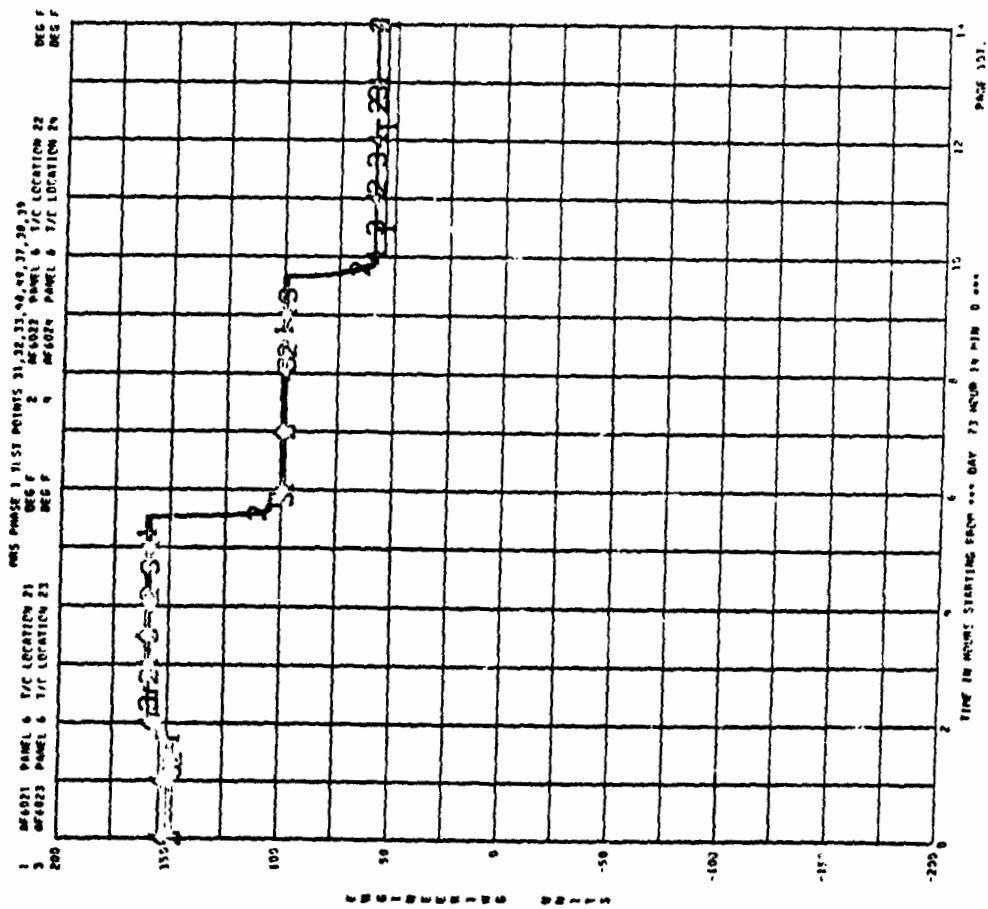


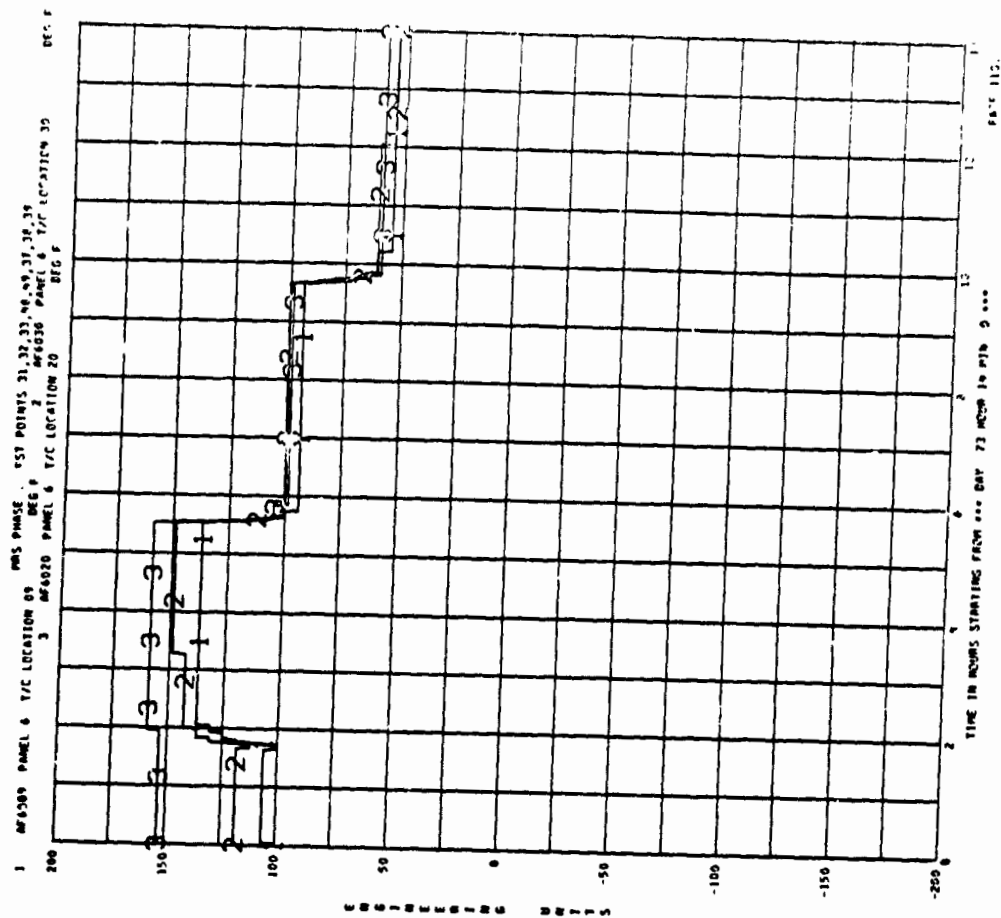
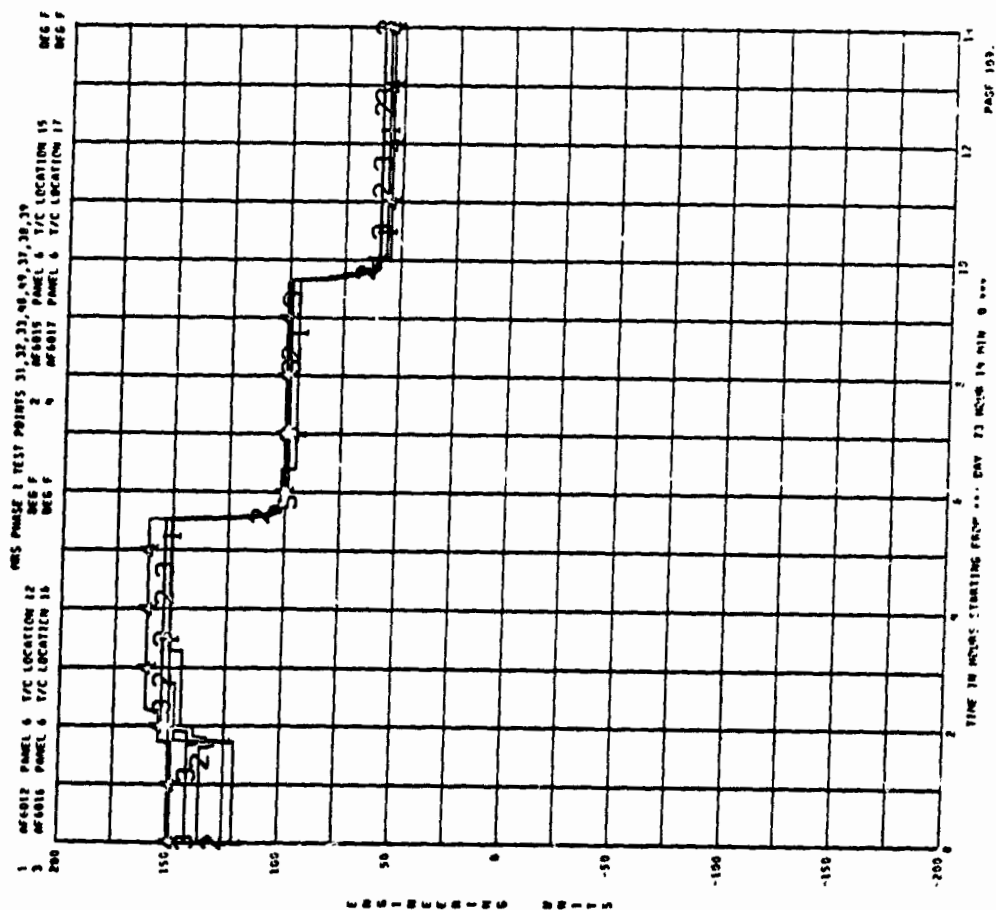


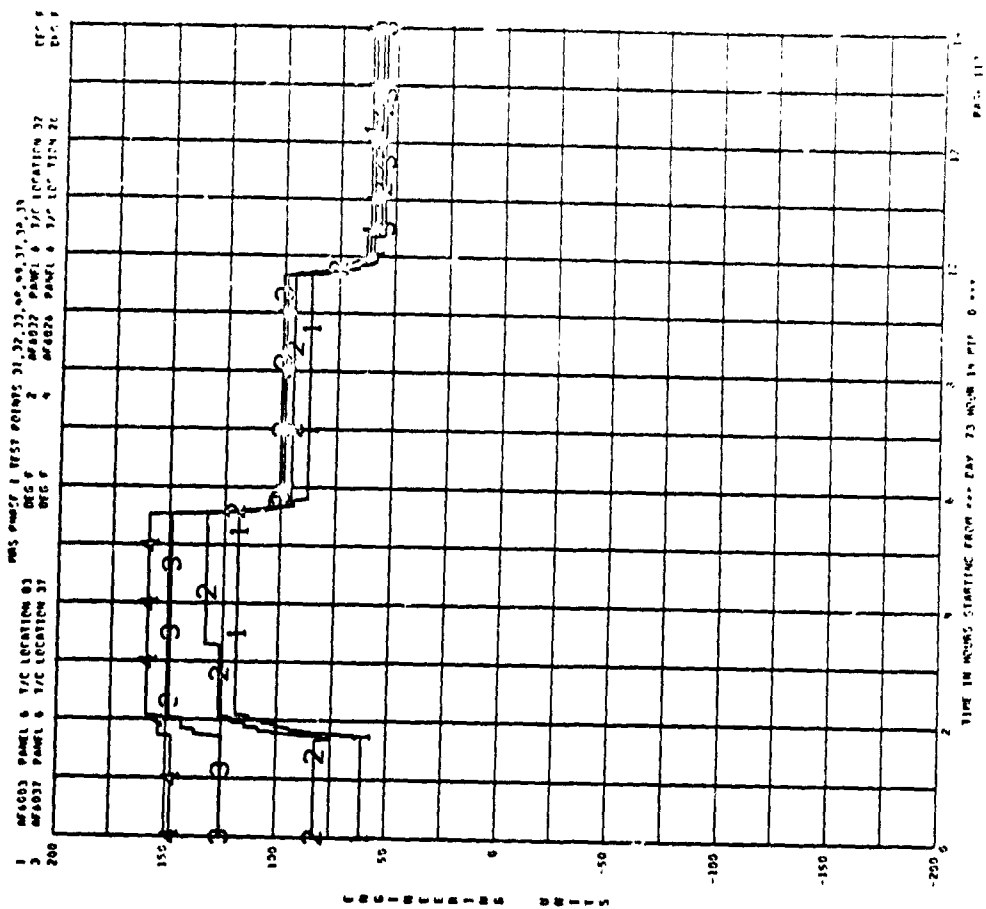
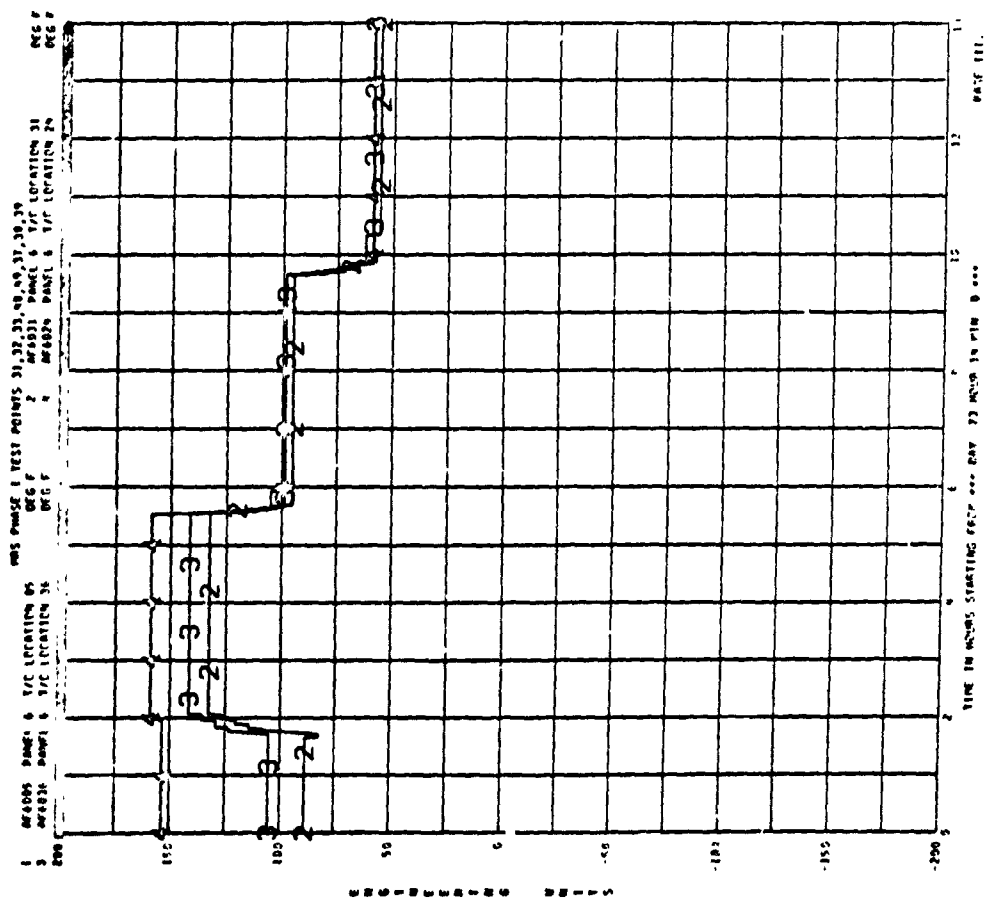


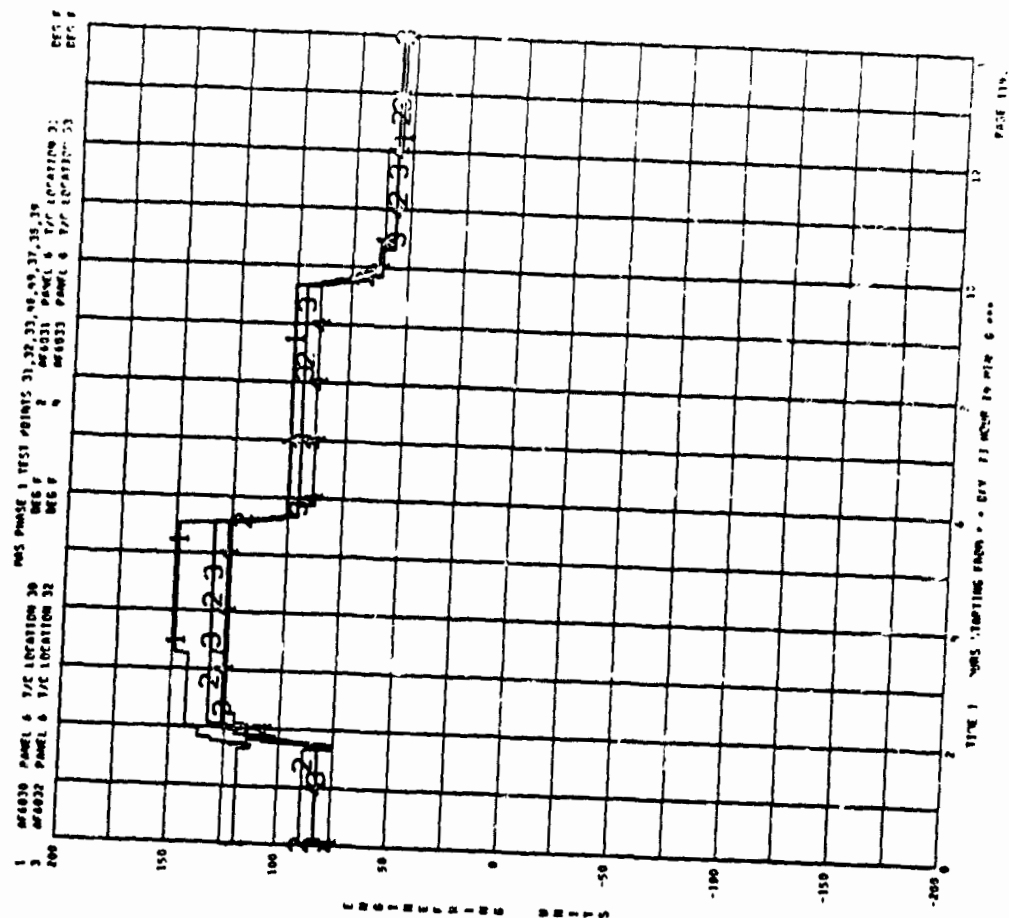
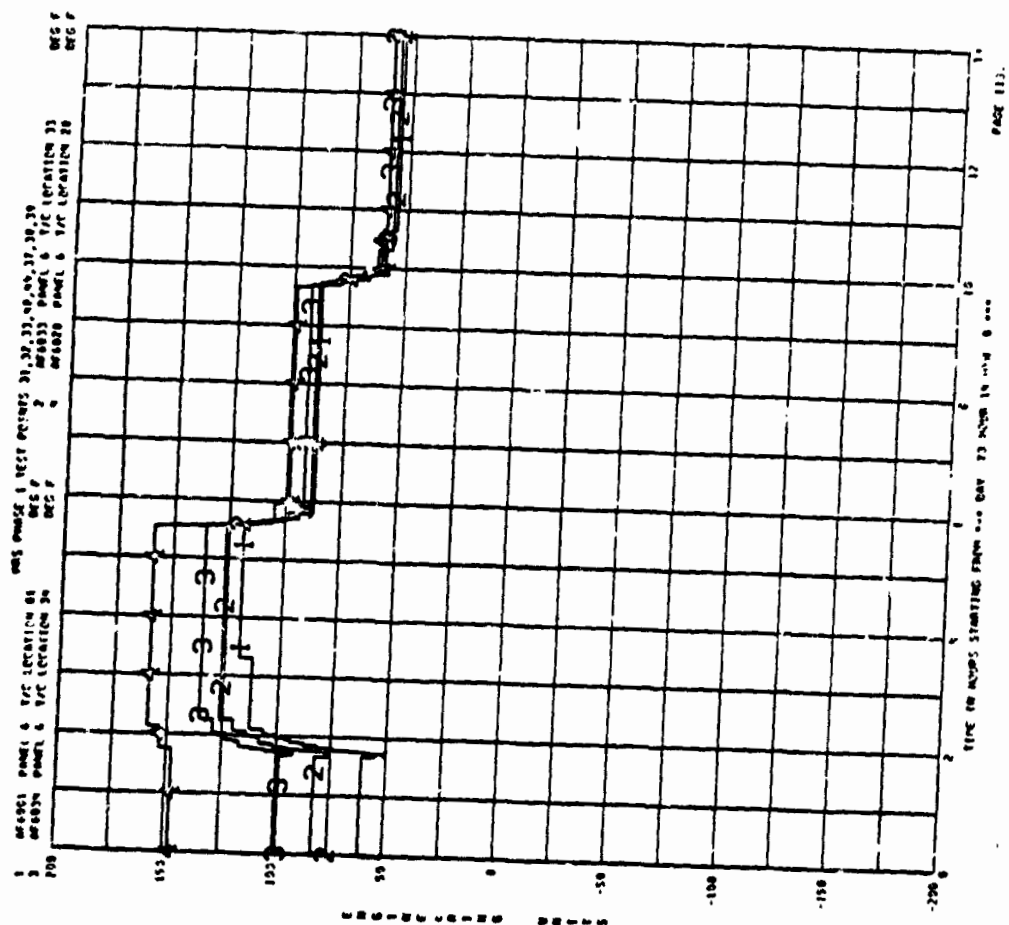




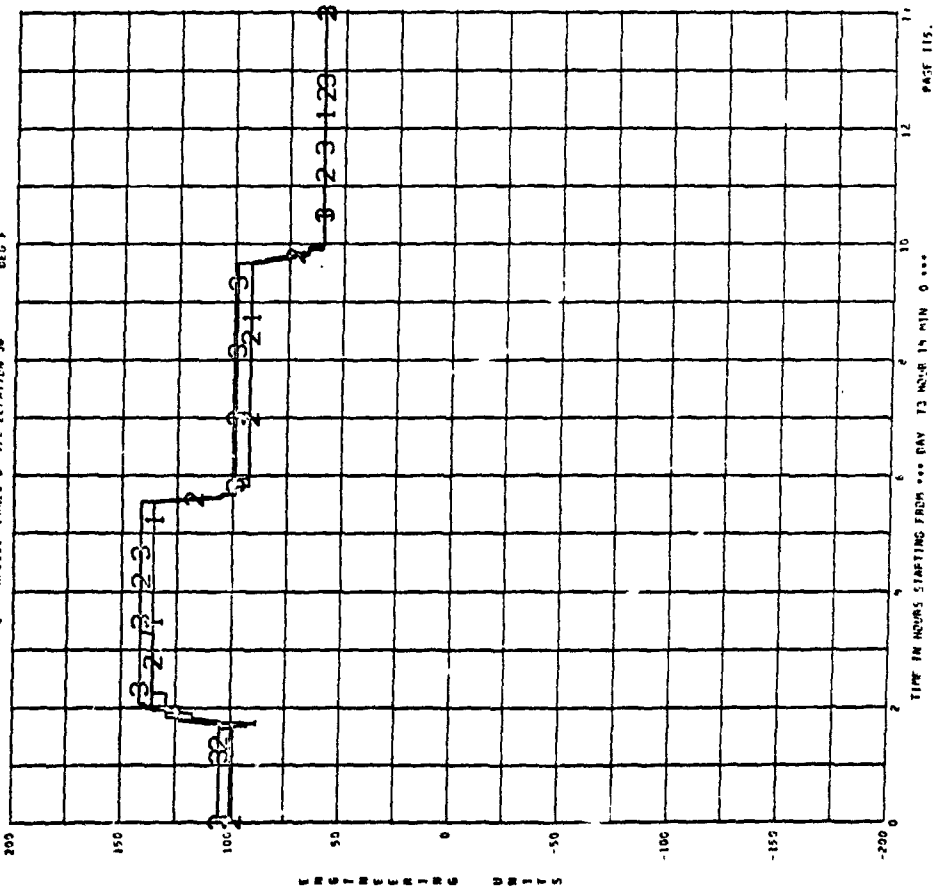




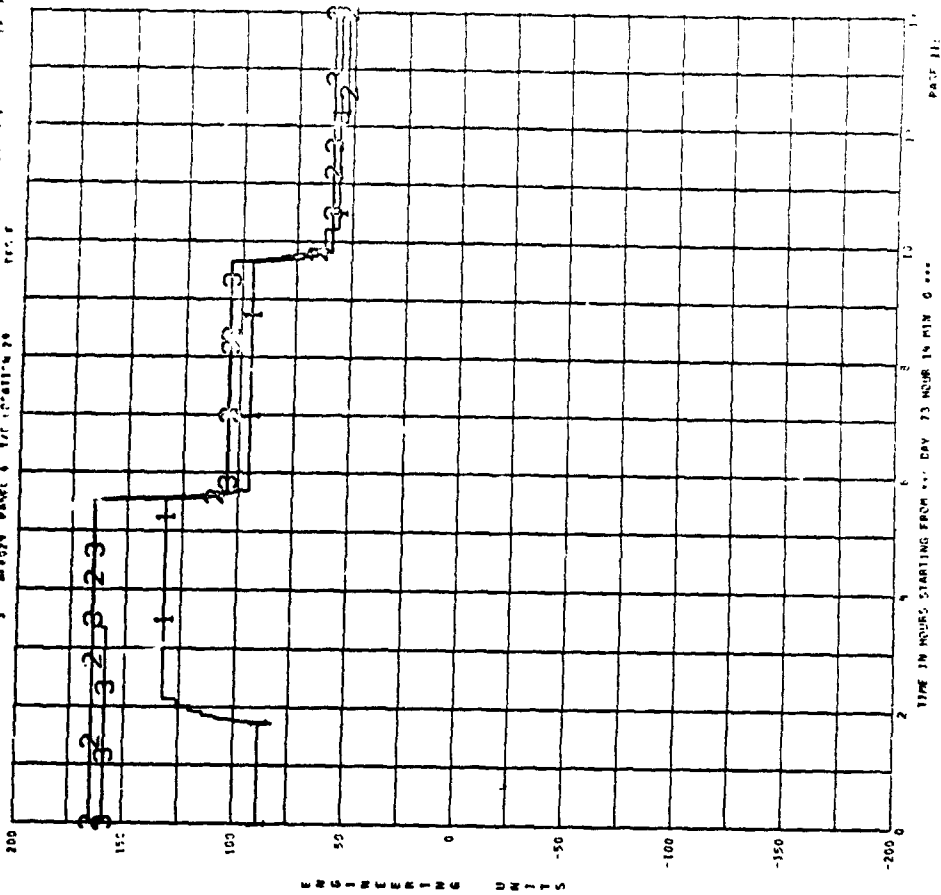


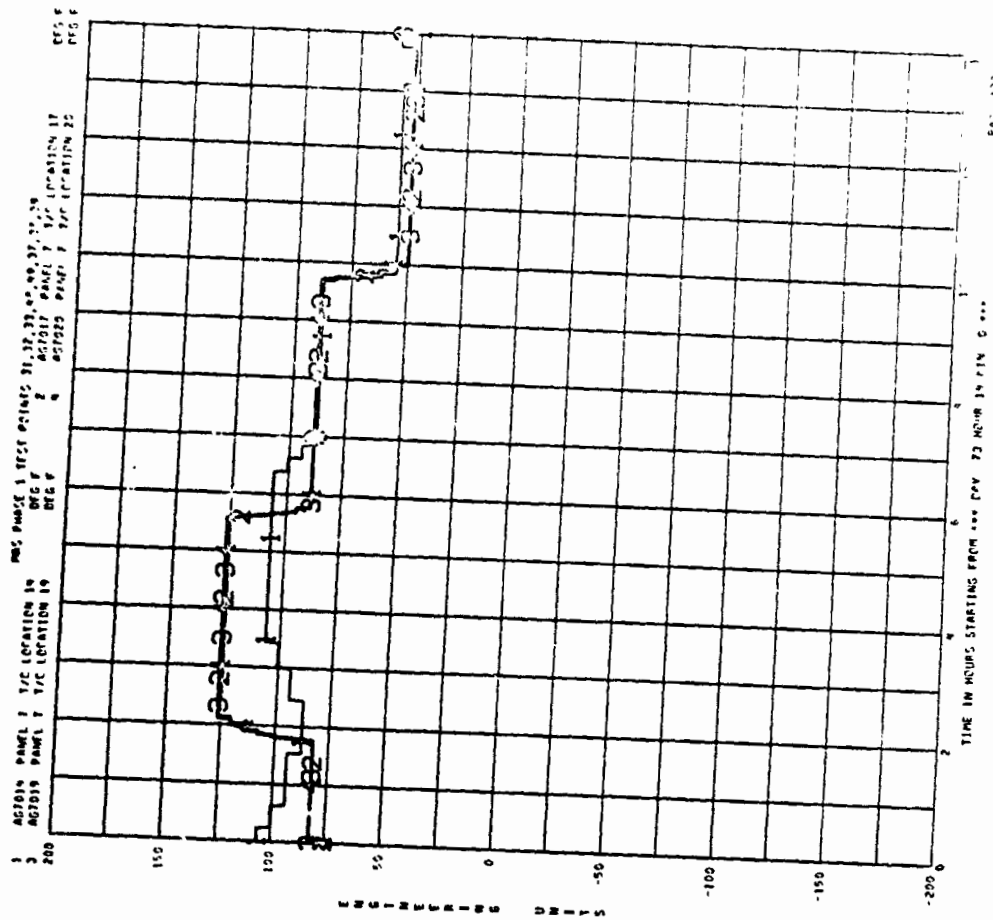
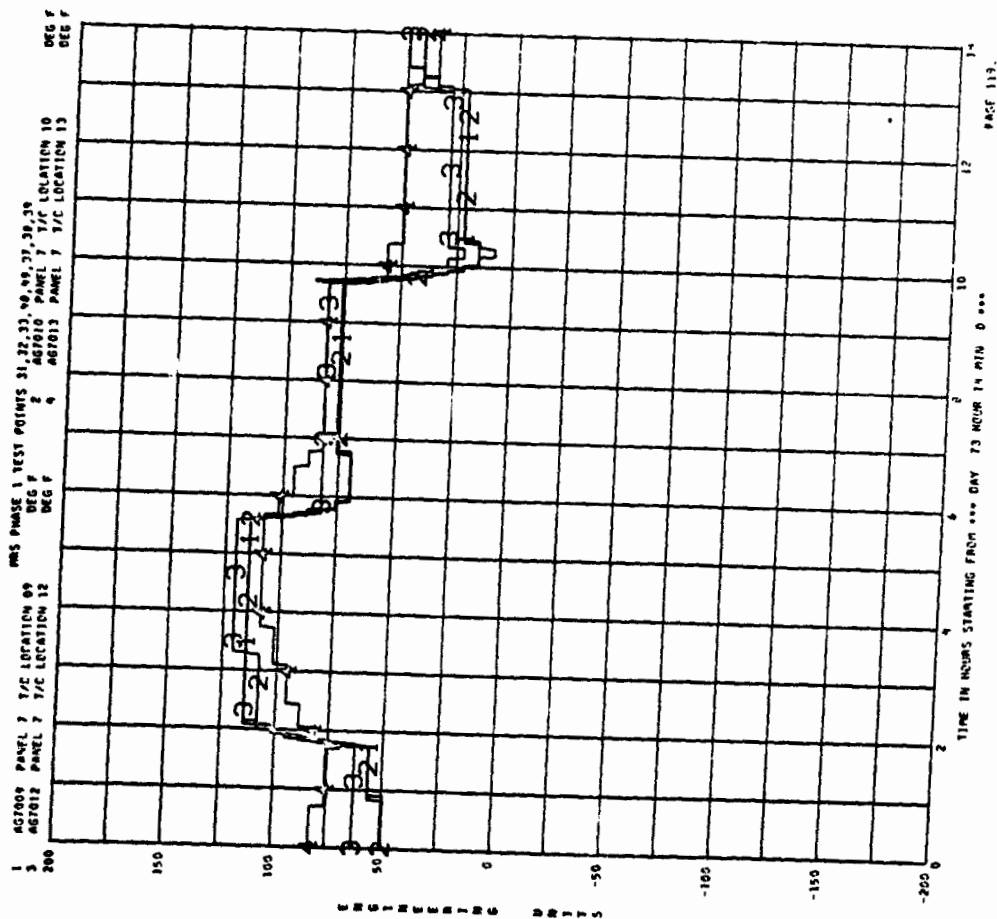


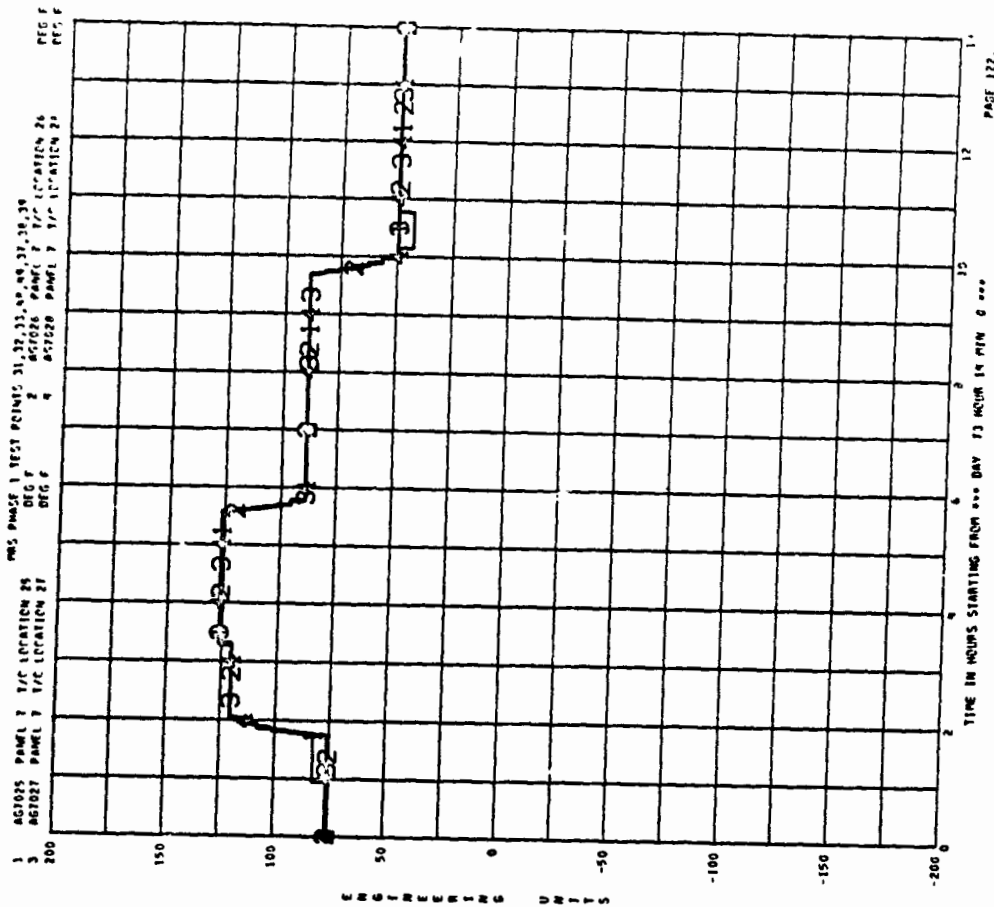
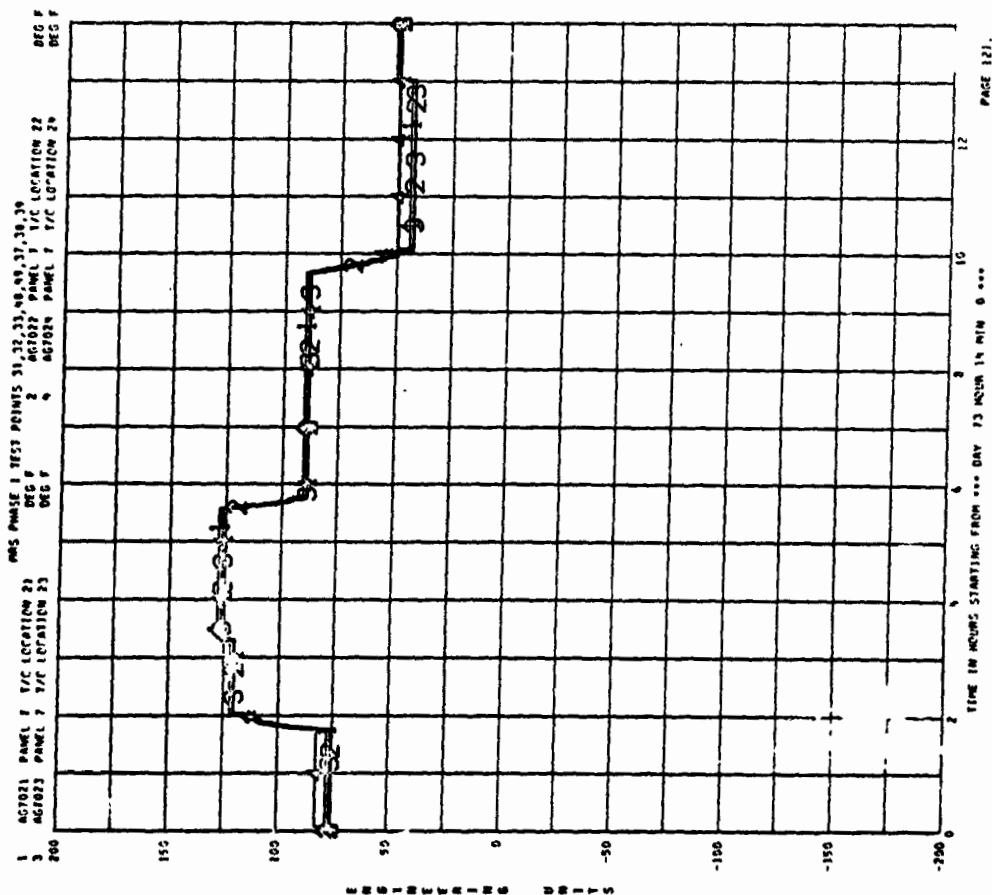
PHASE I TEST POINTS 31, 32, 33, 48, 49, 37, 38, 39

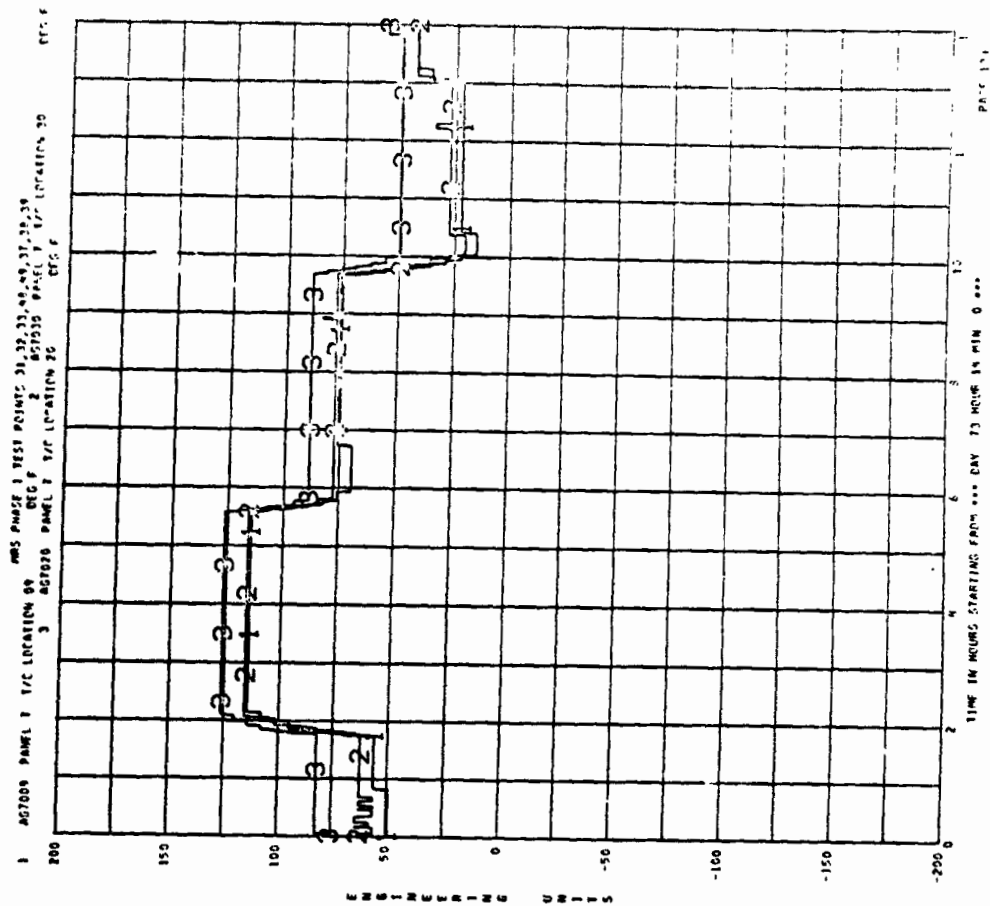
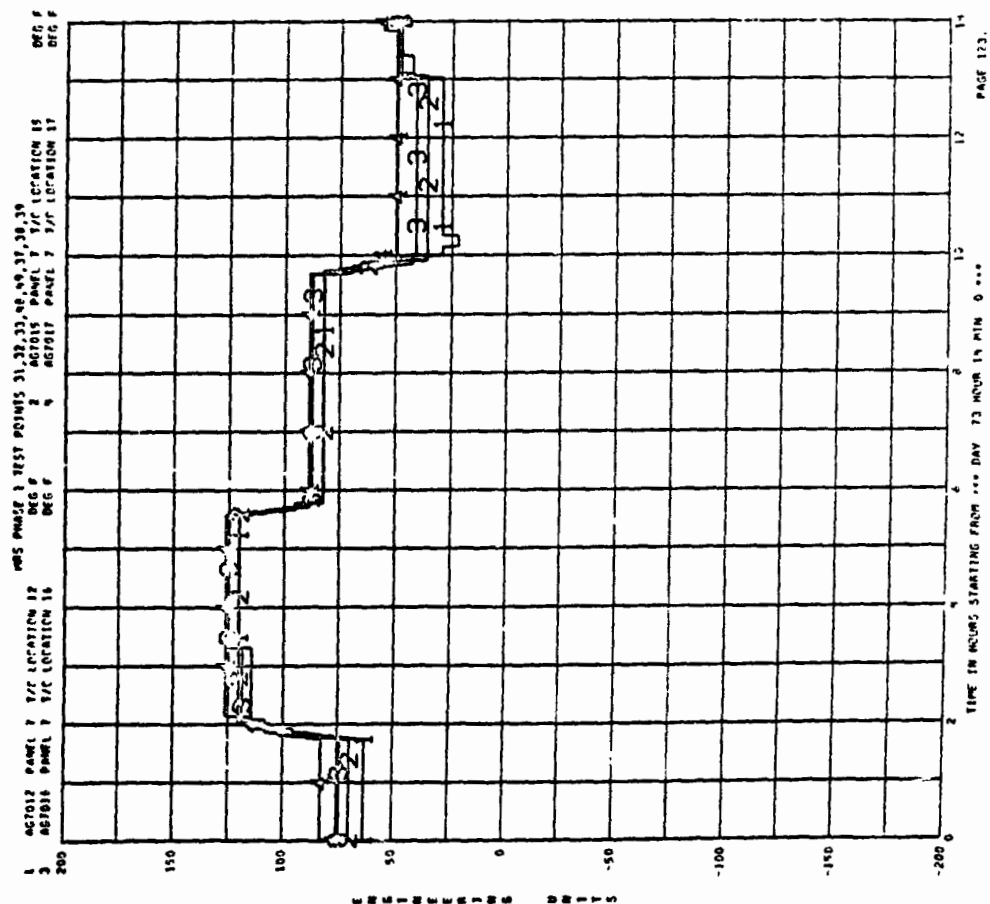


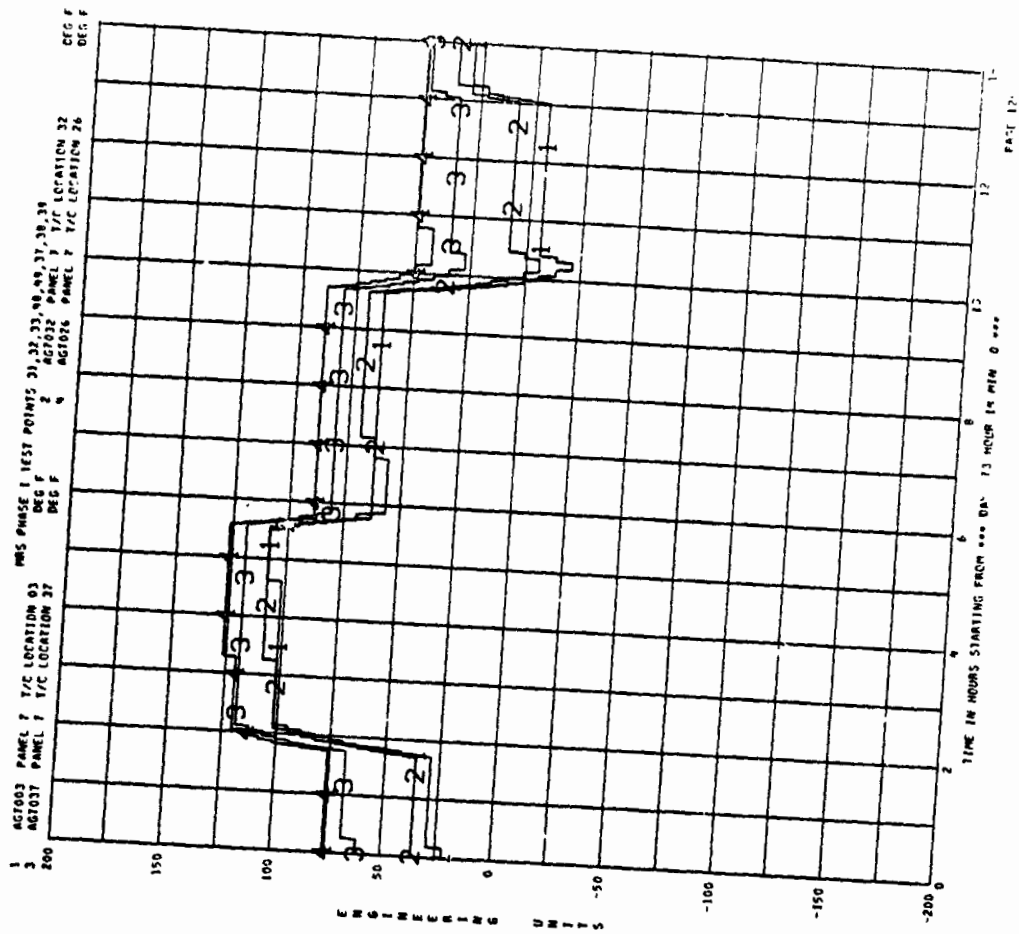
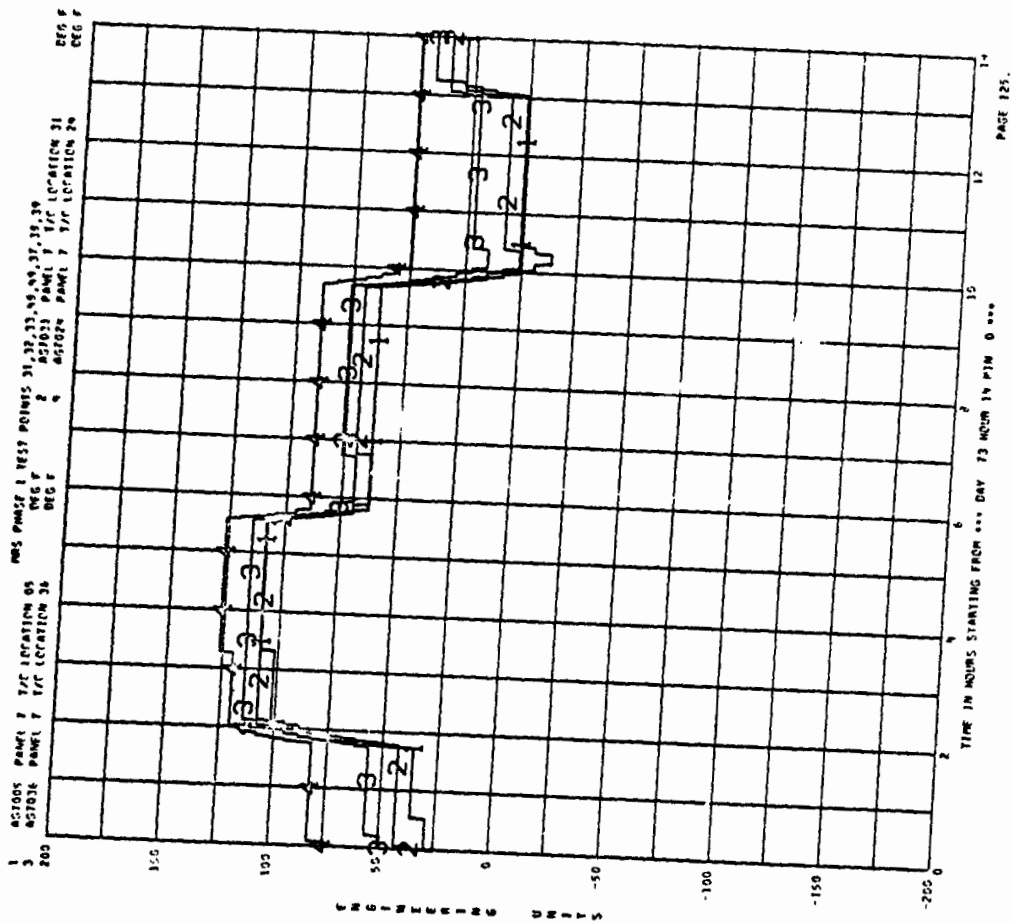
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|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

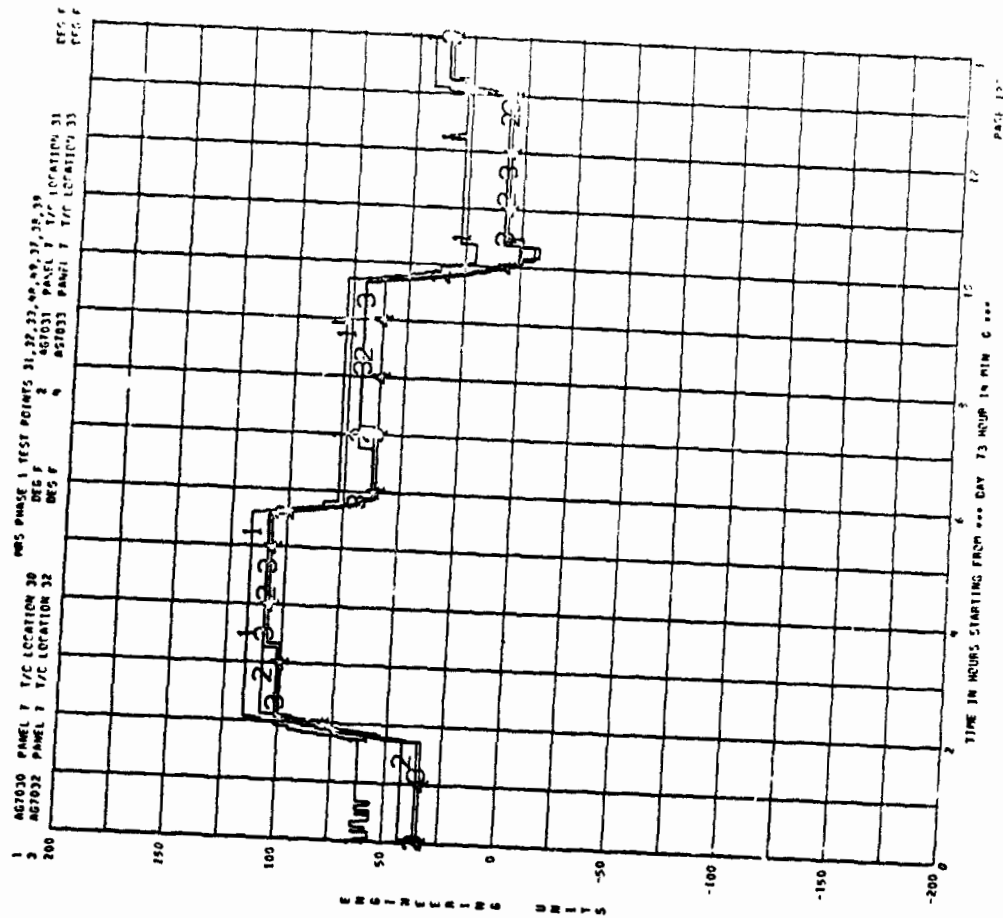
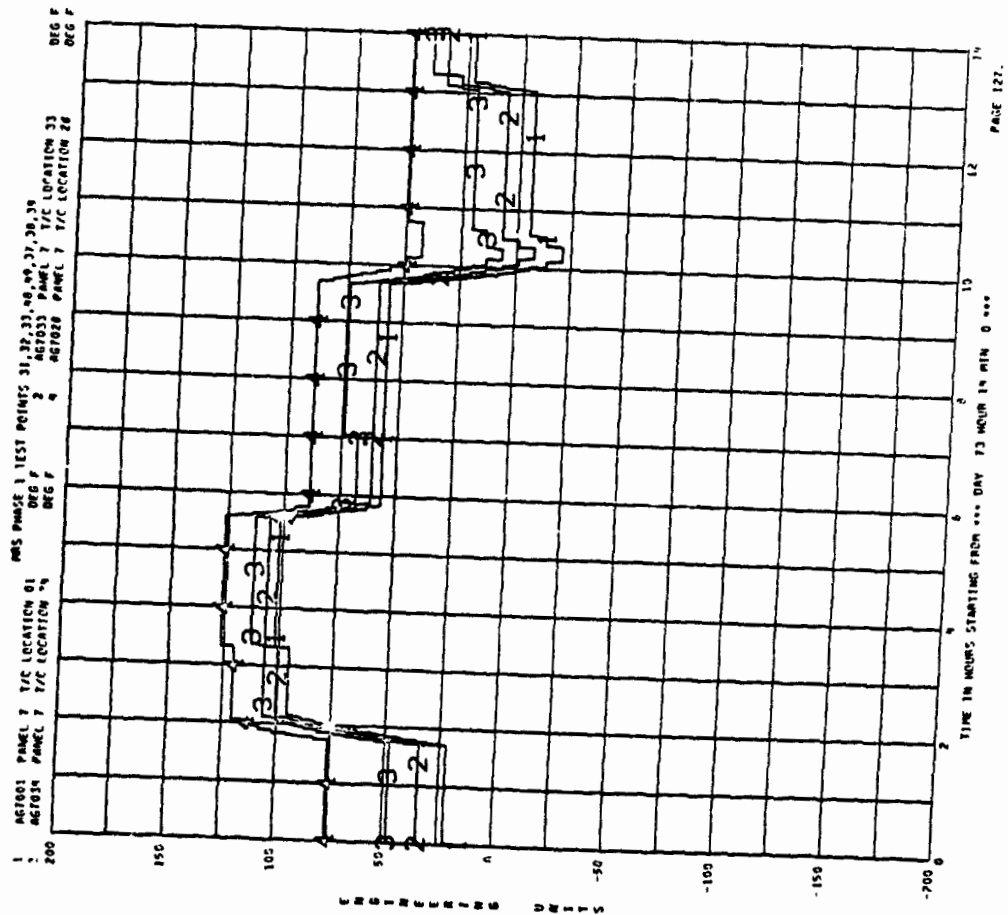


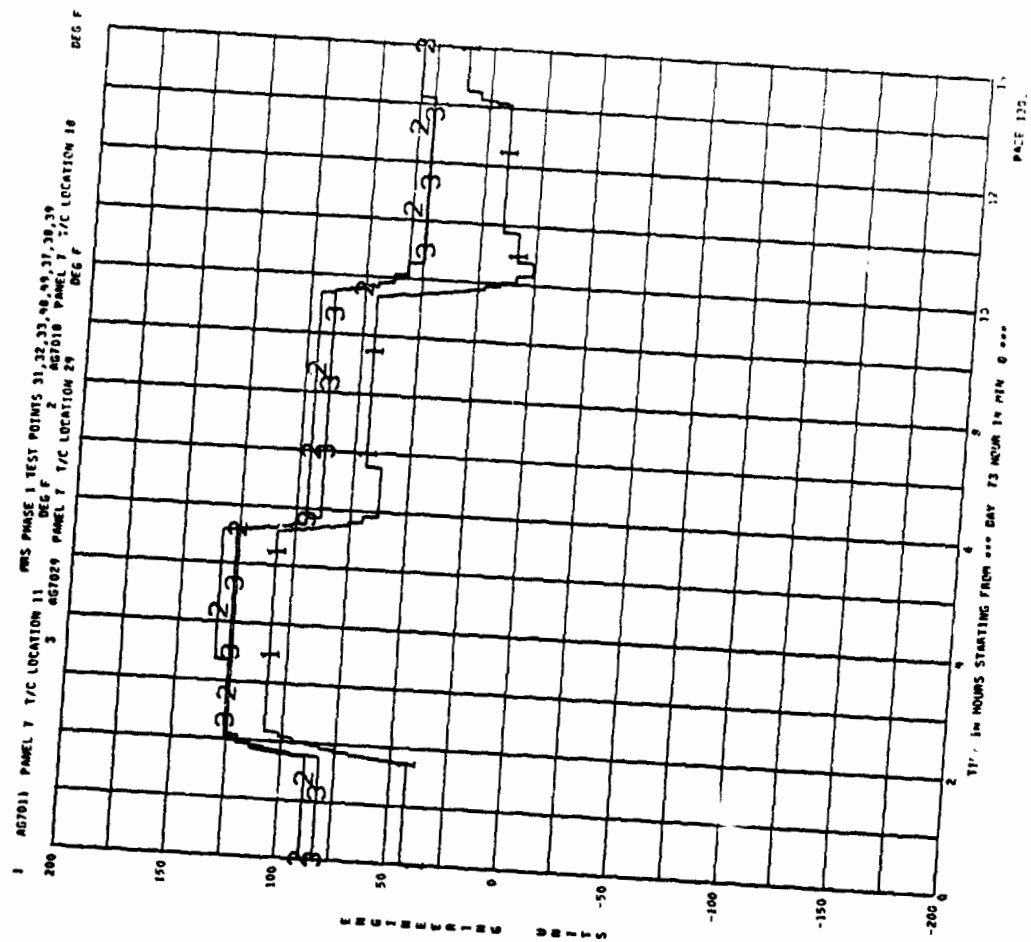
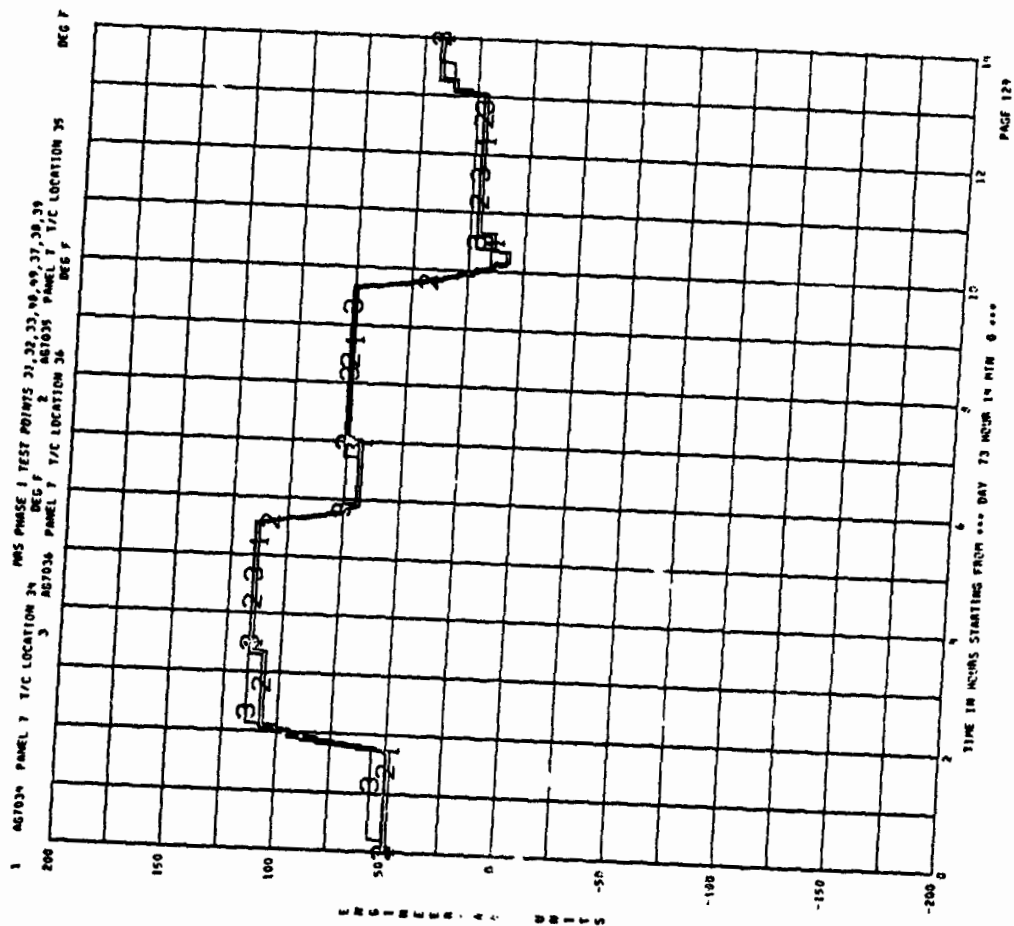


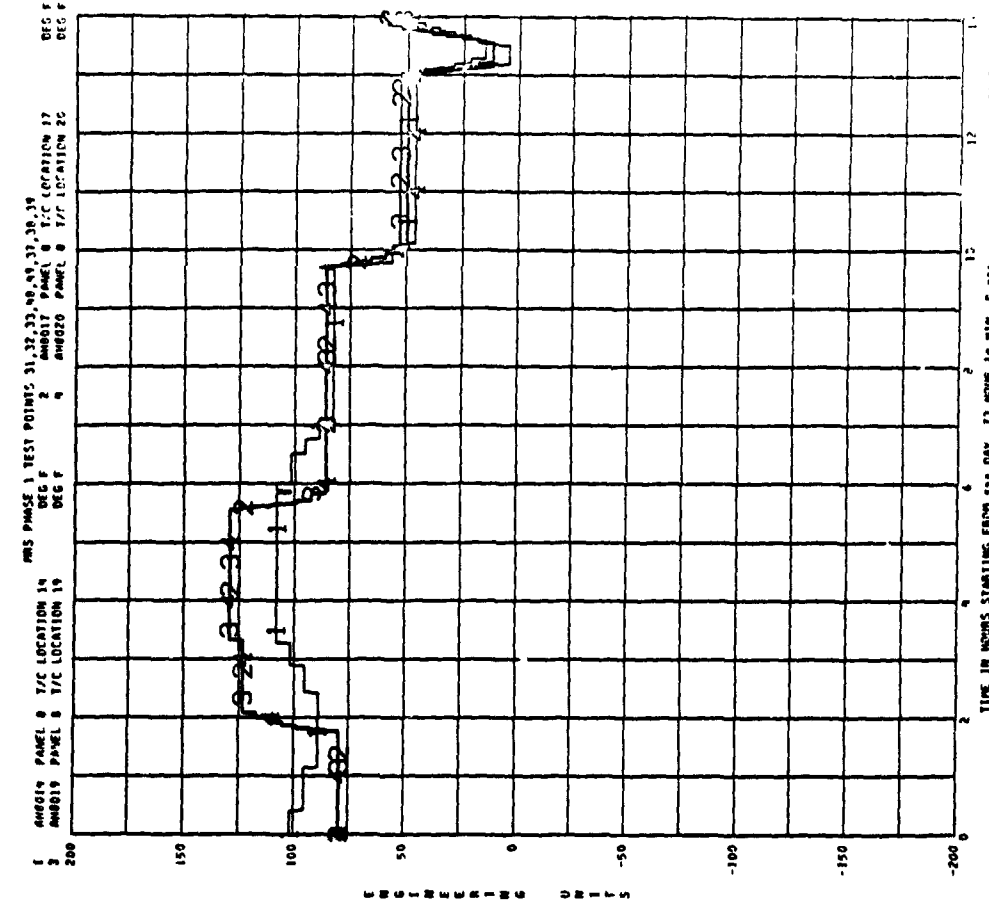
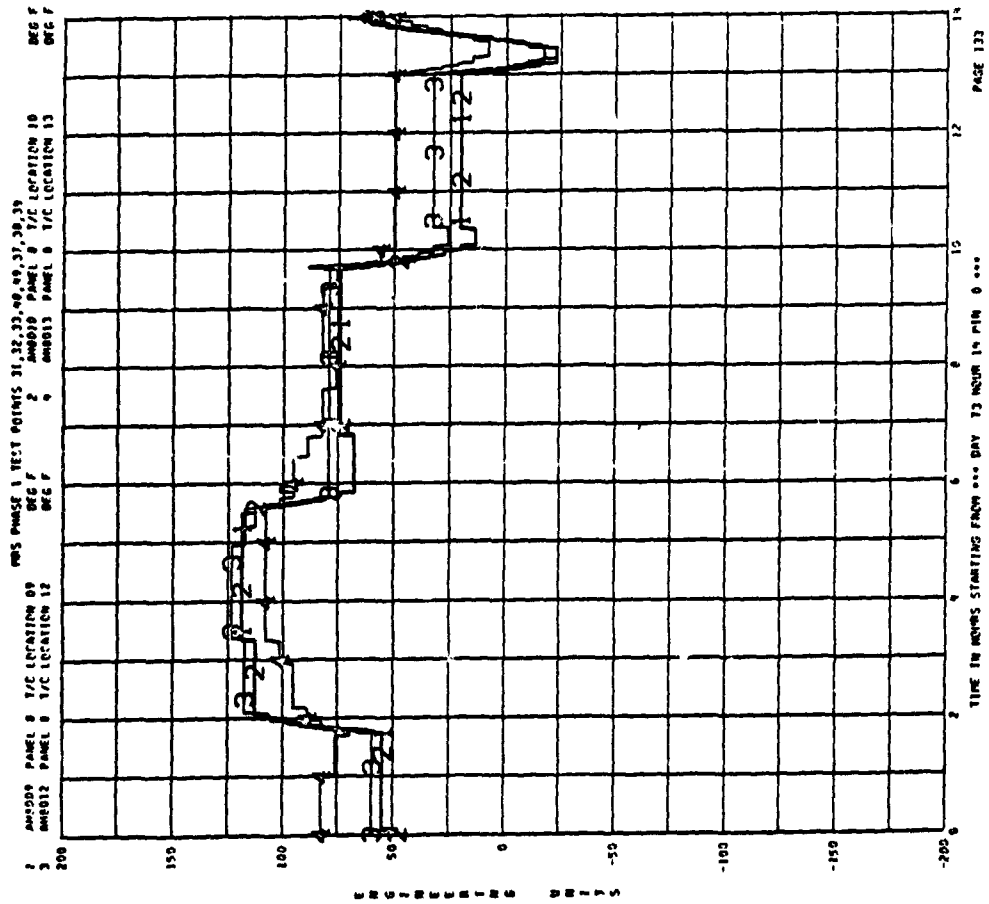


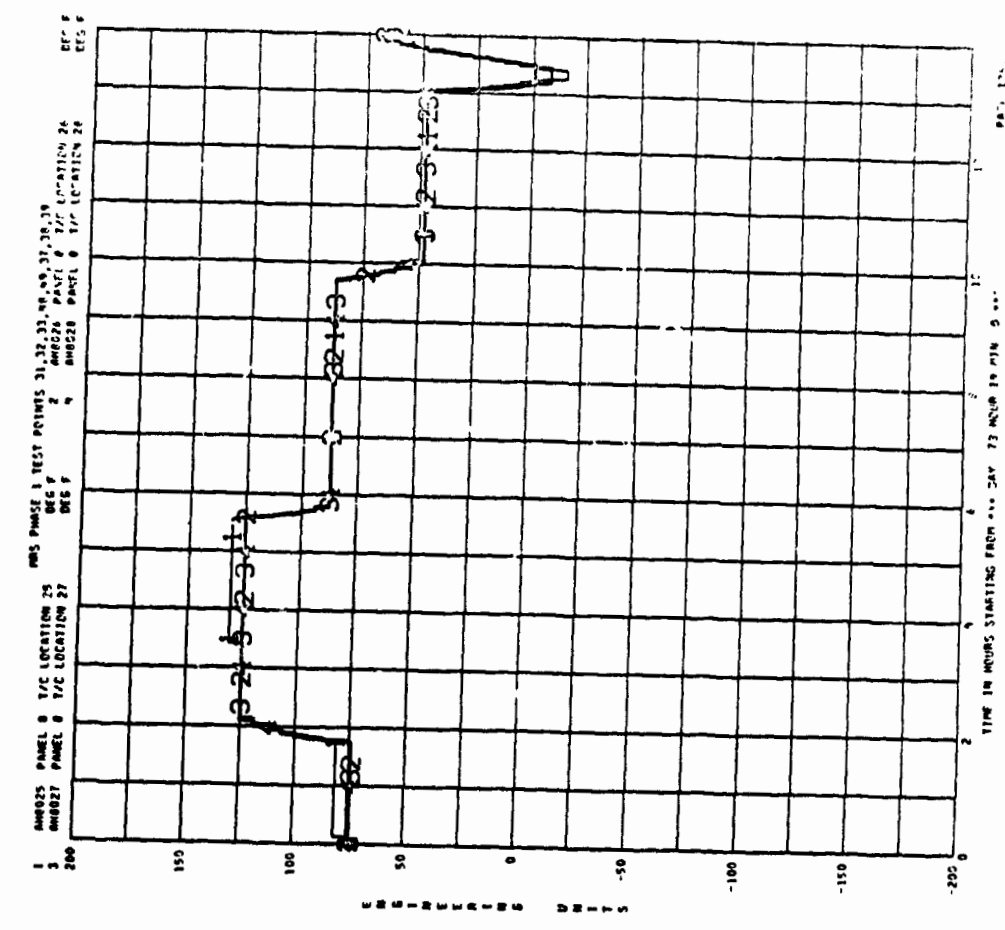
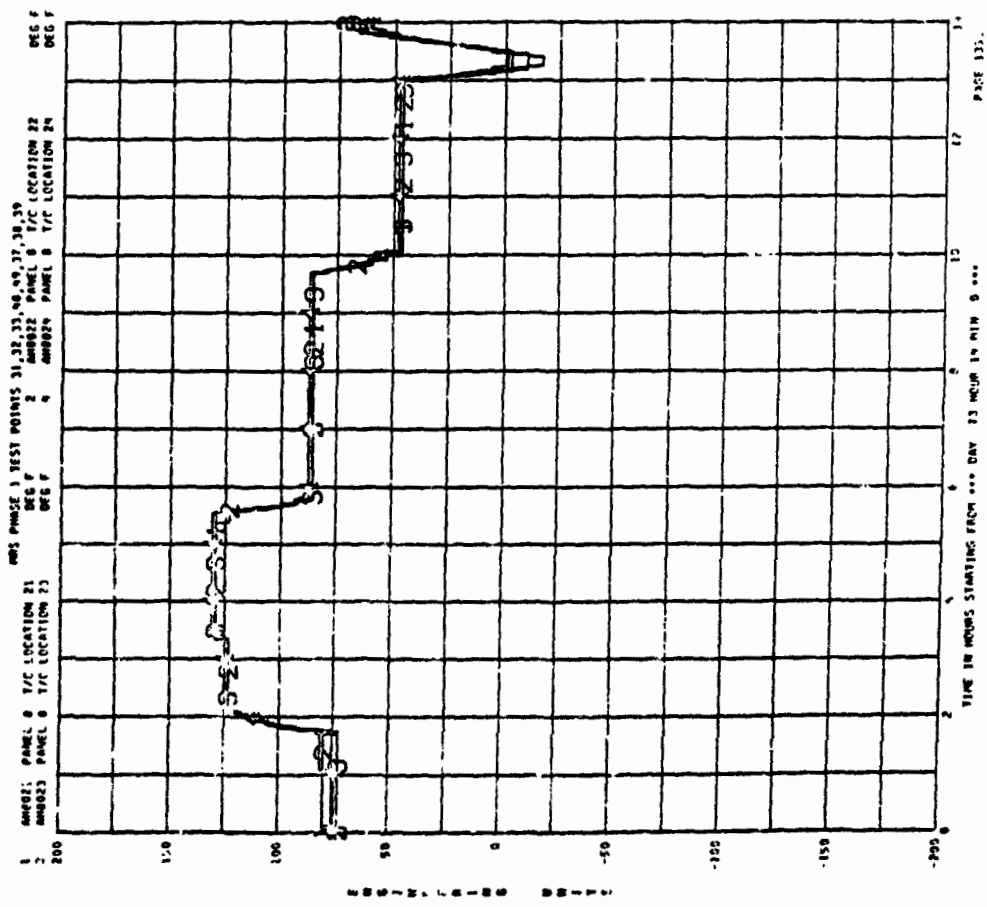


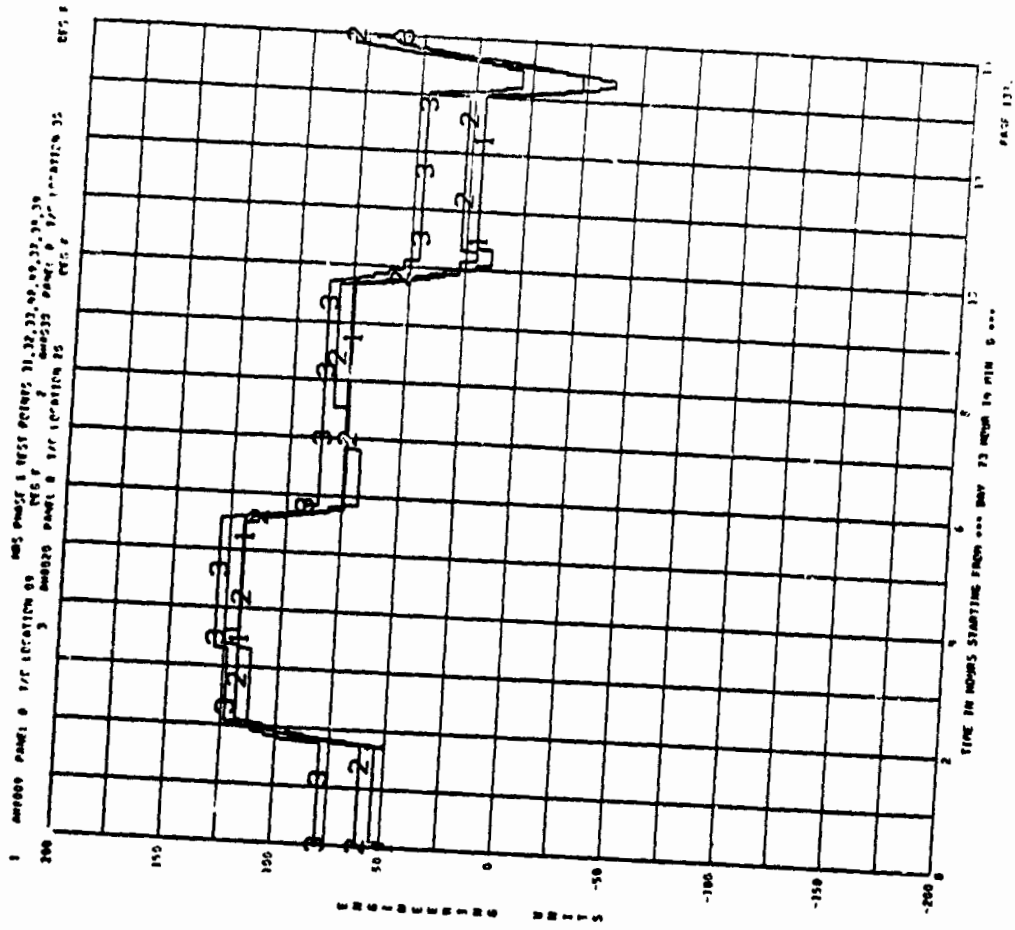
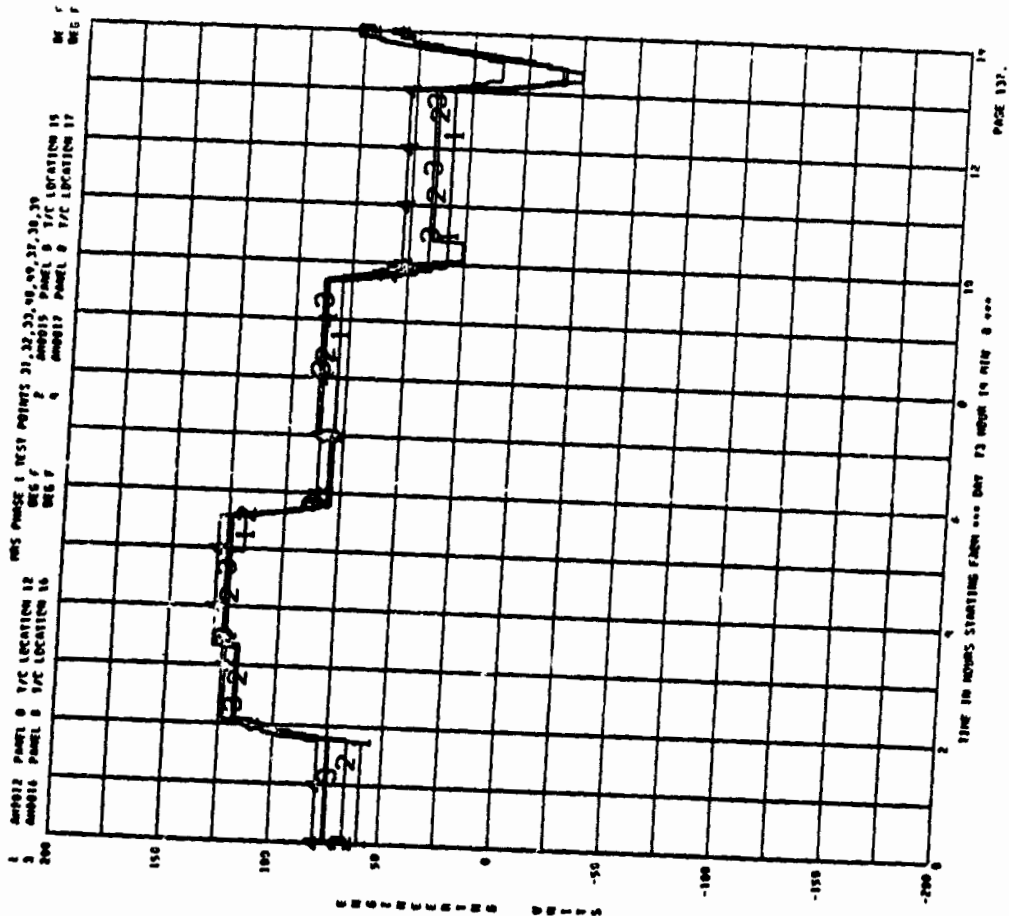


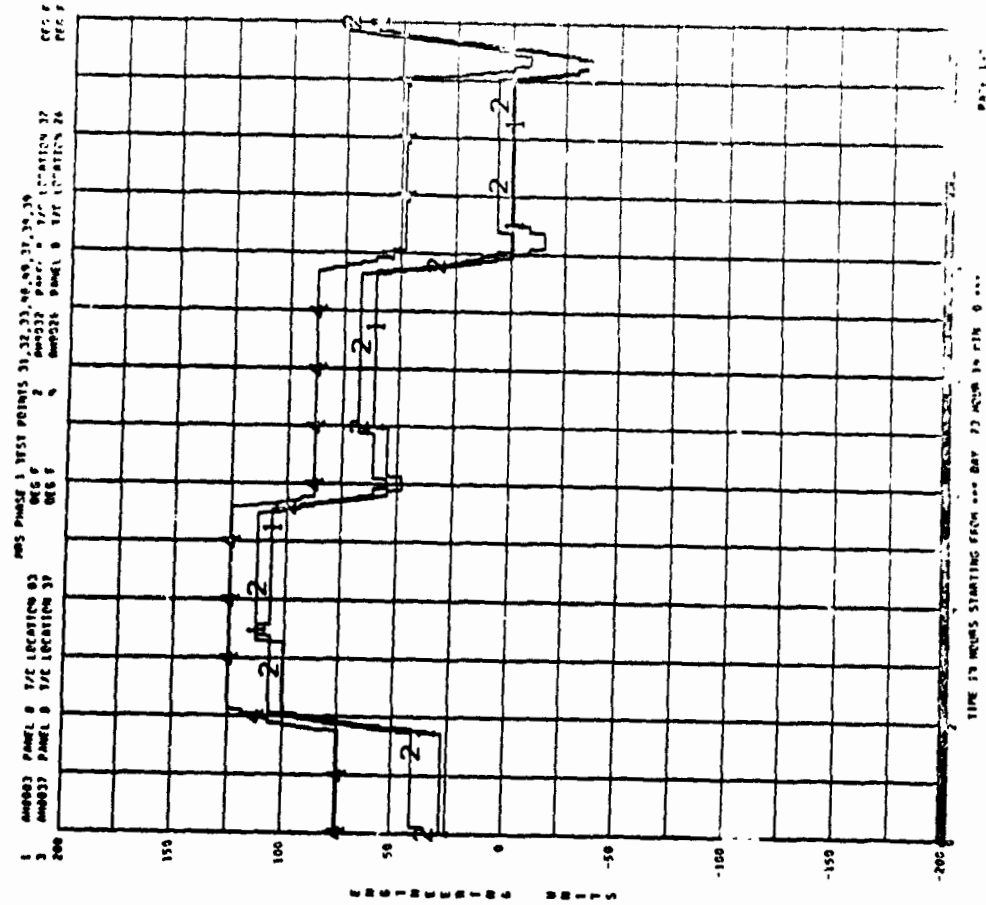
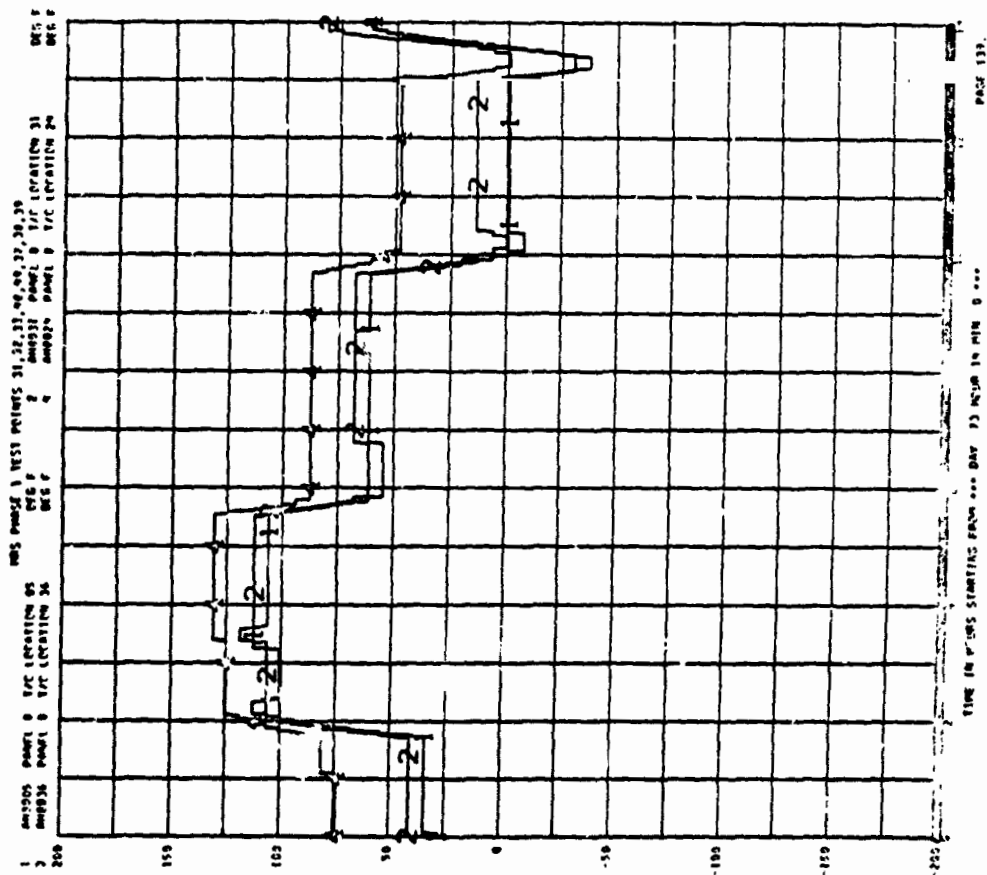










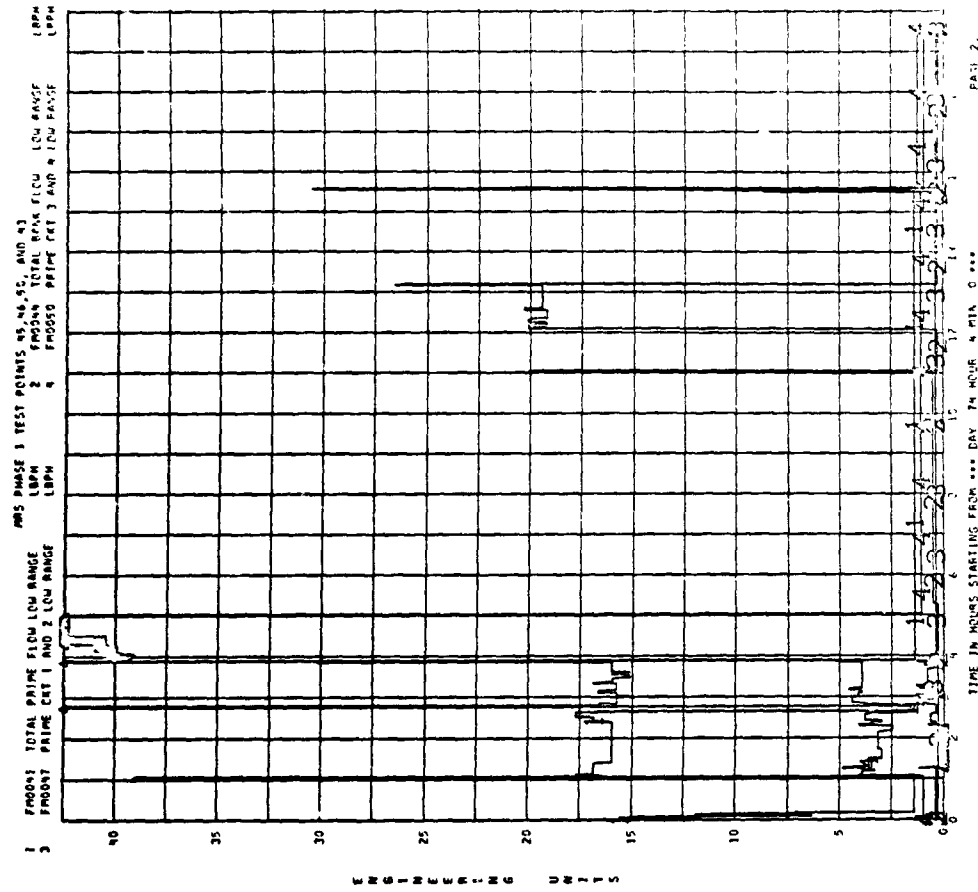
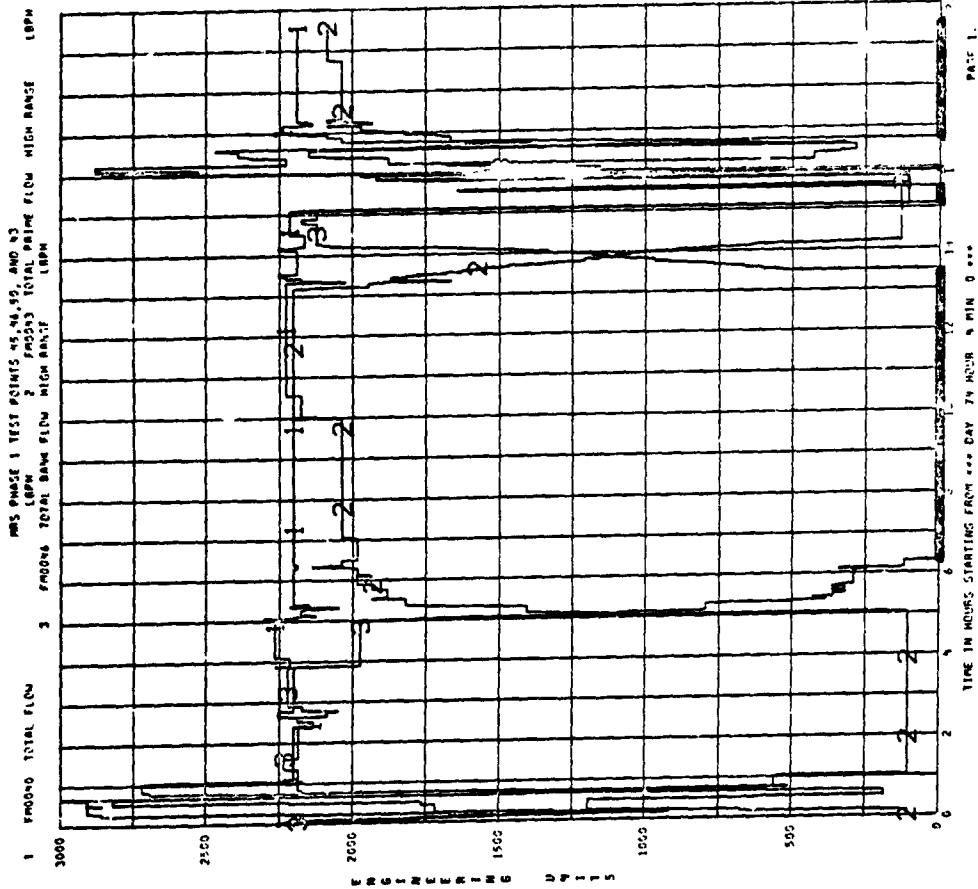


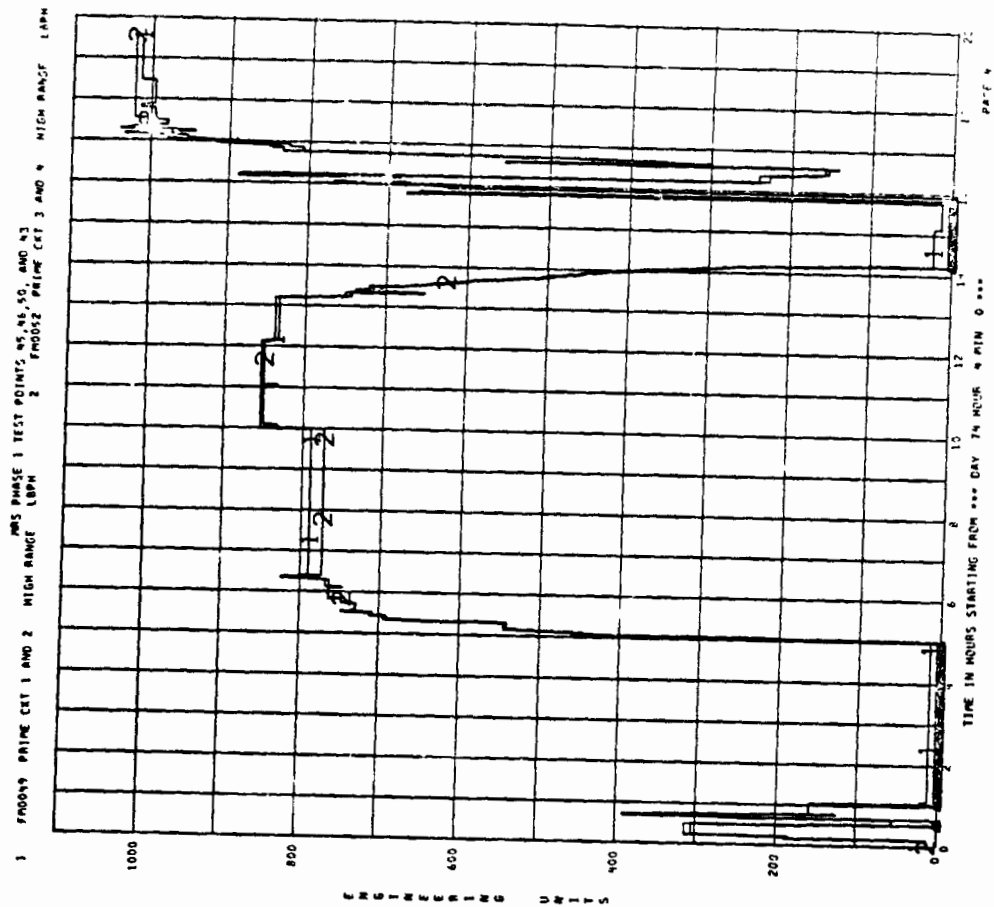
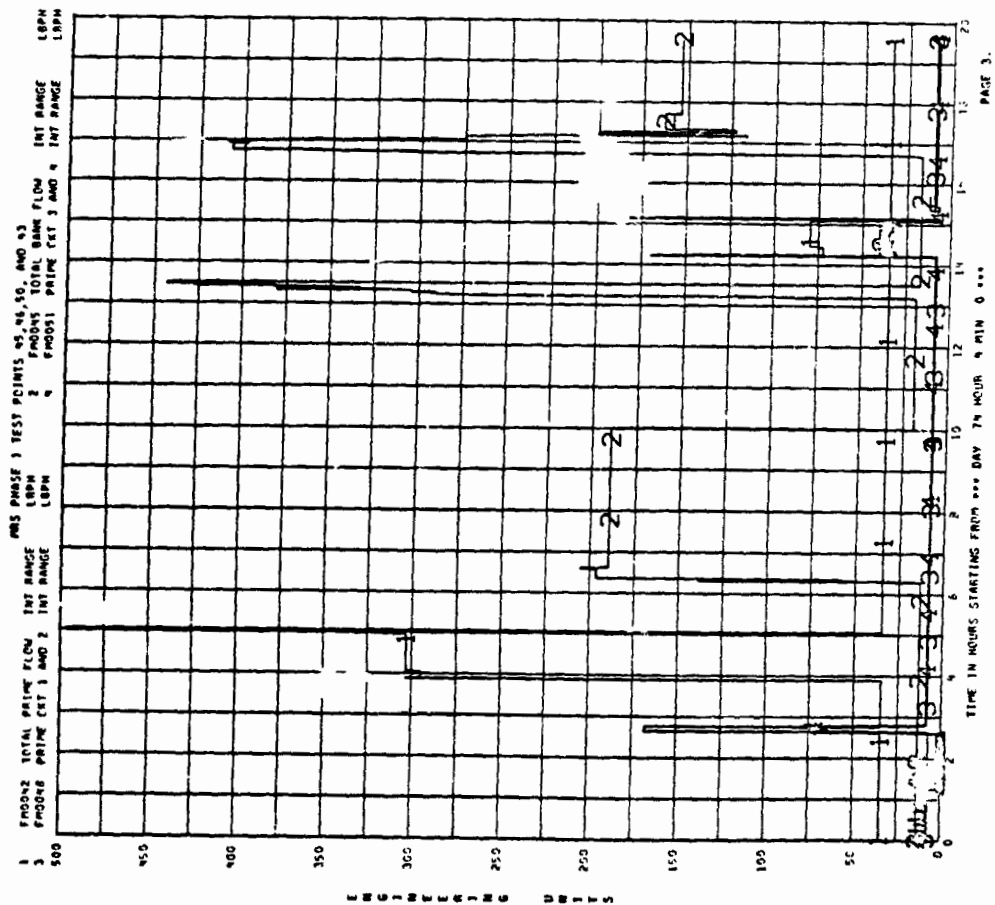
TEST GROUP G

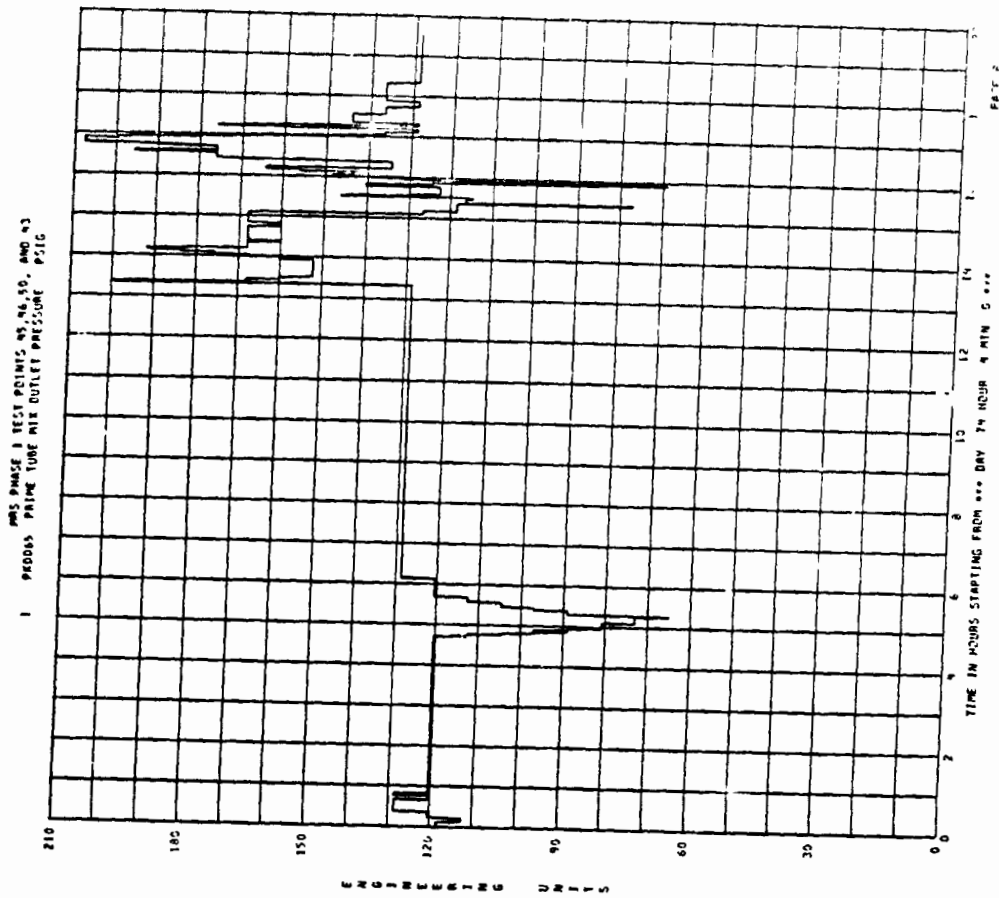
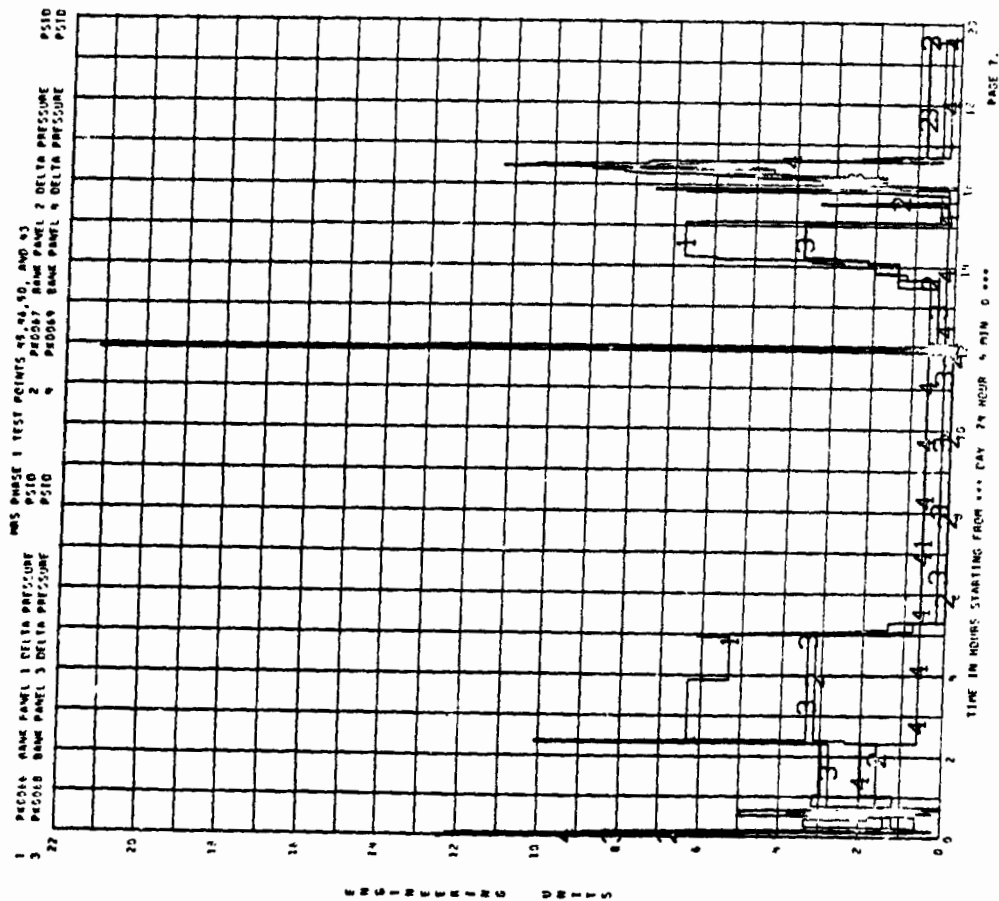
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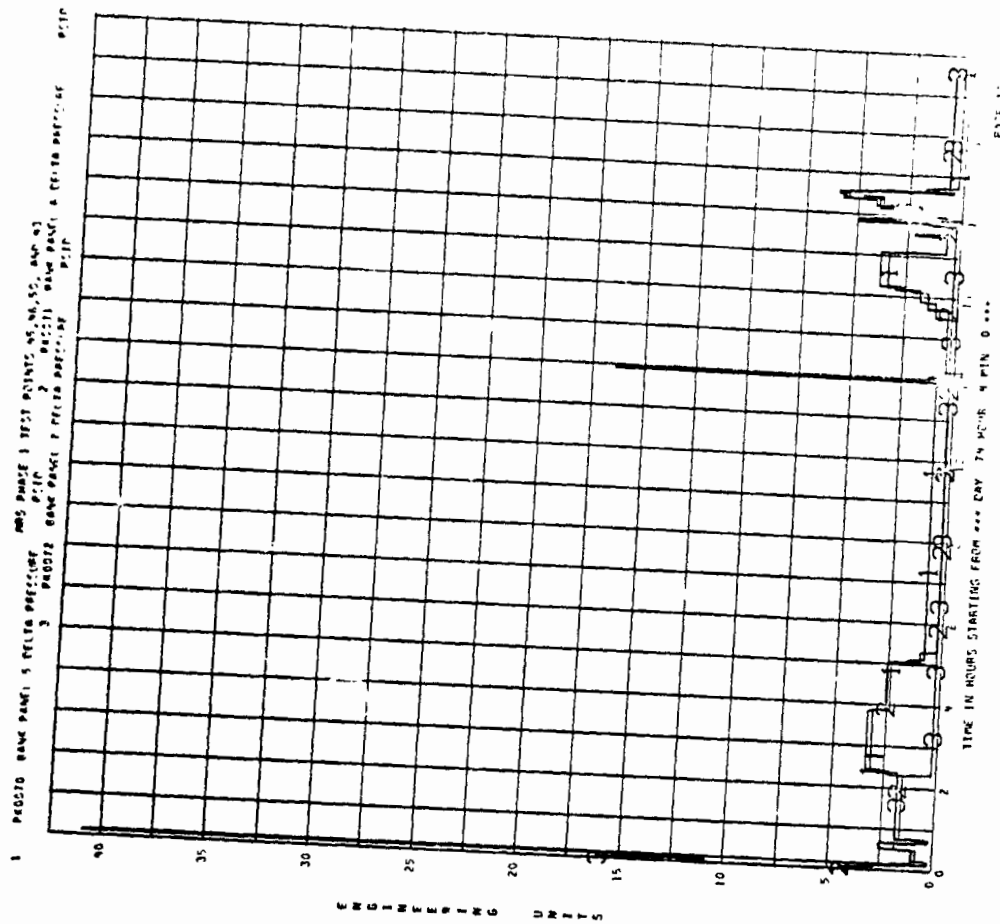
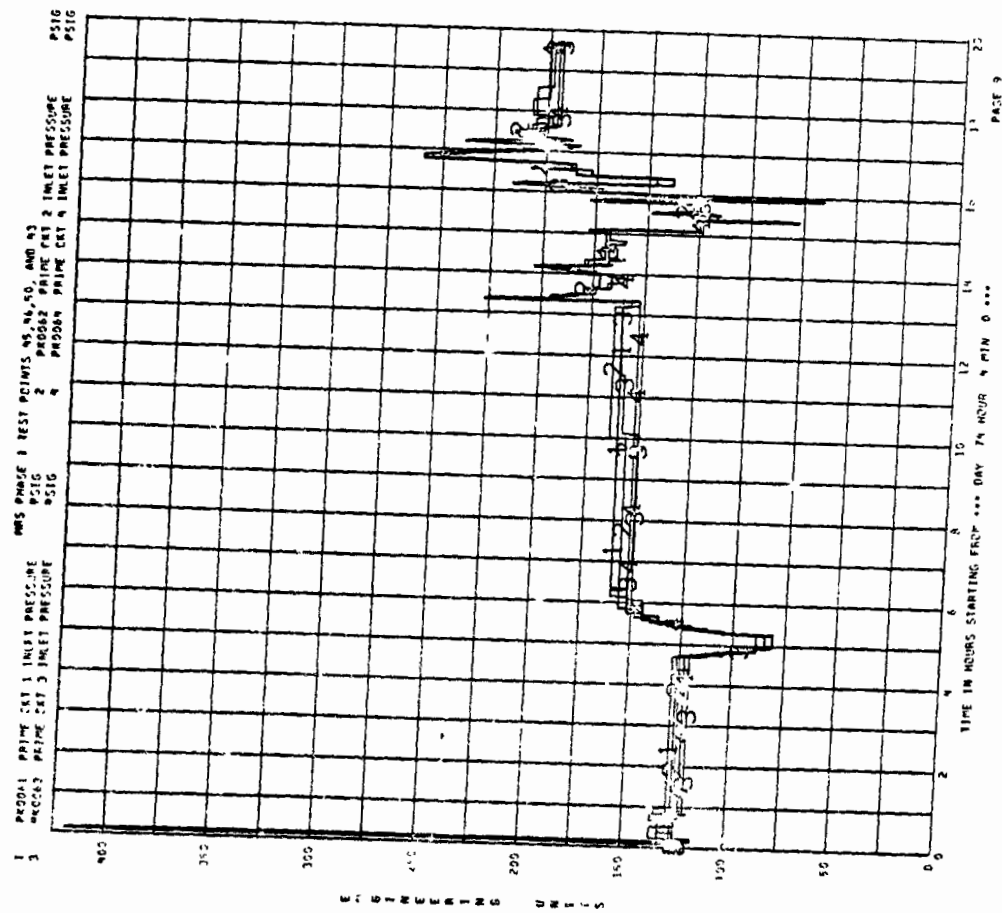
INCLUDES TEST POINTS

45
46
50
43

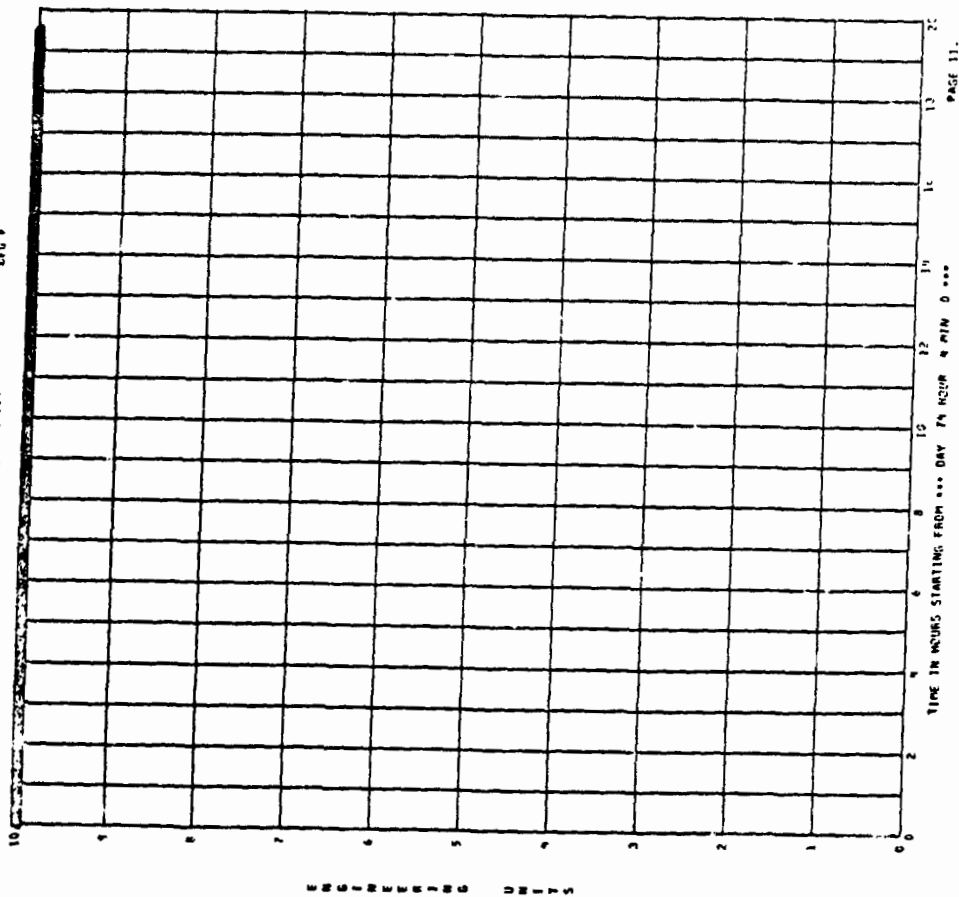




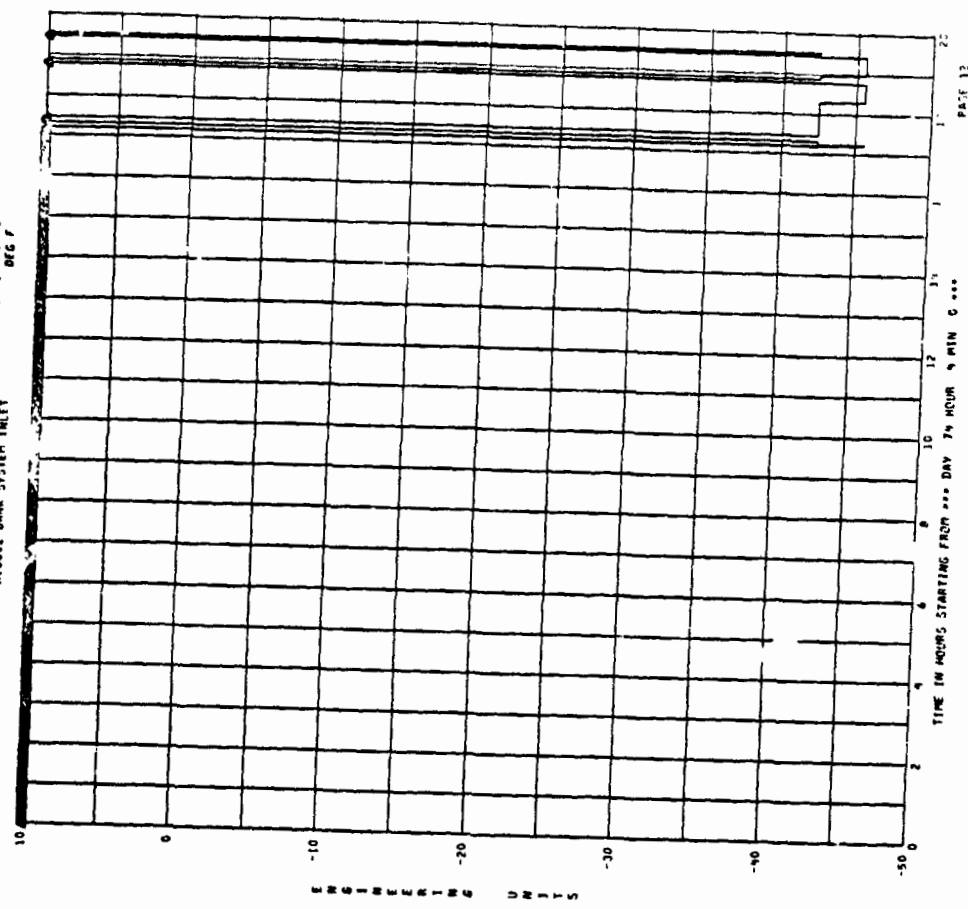




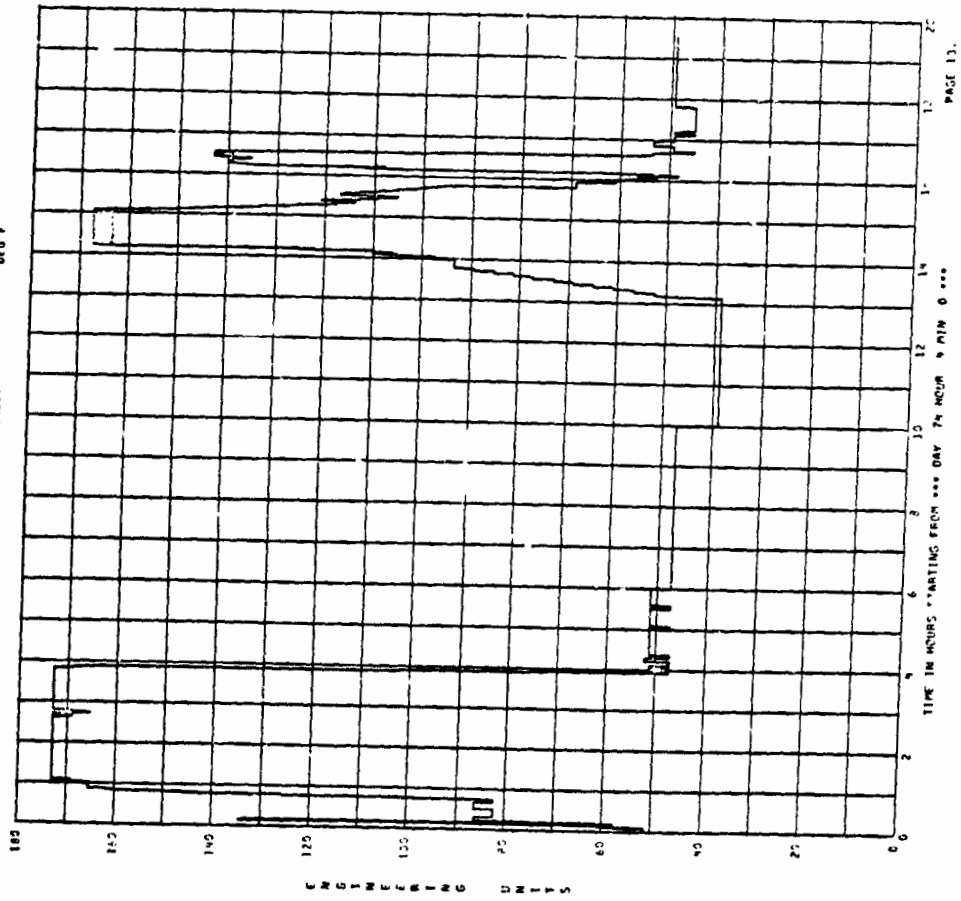
MS PHASE 1 TEST POINTS 45, 46, 50, AND 52
 1 A10001 MAIN SYSTEM INLET DEG F



MS PHASE 1 TEST POINTS 45, 46, 50, AND 53
 1 A10002 BANK SYSTEM INLET DEG F

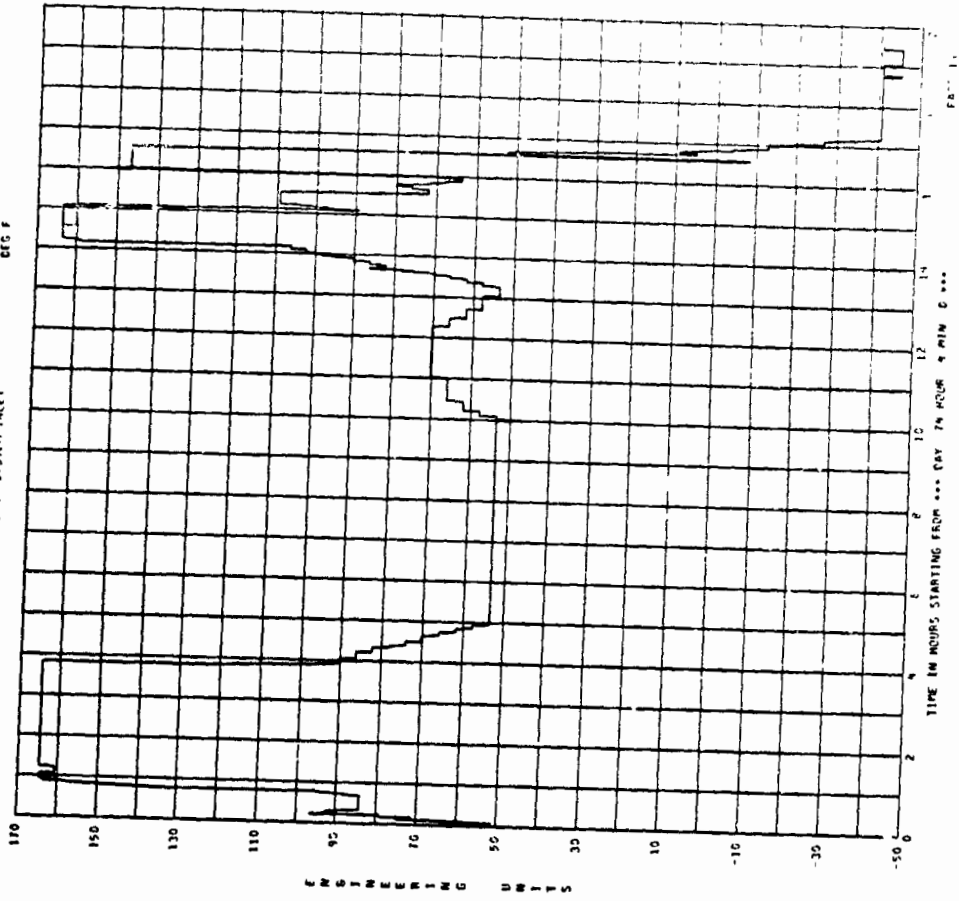


1 RMS PHASE 1 TEST POINTS 45, 46, 50, AND 53
ADJ001 PRIME SYSTEM INLET DEG F

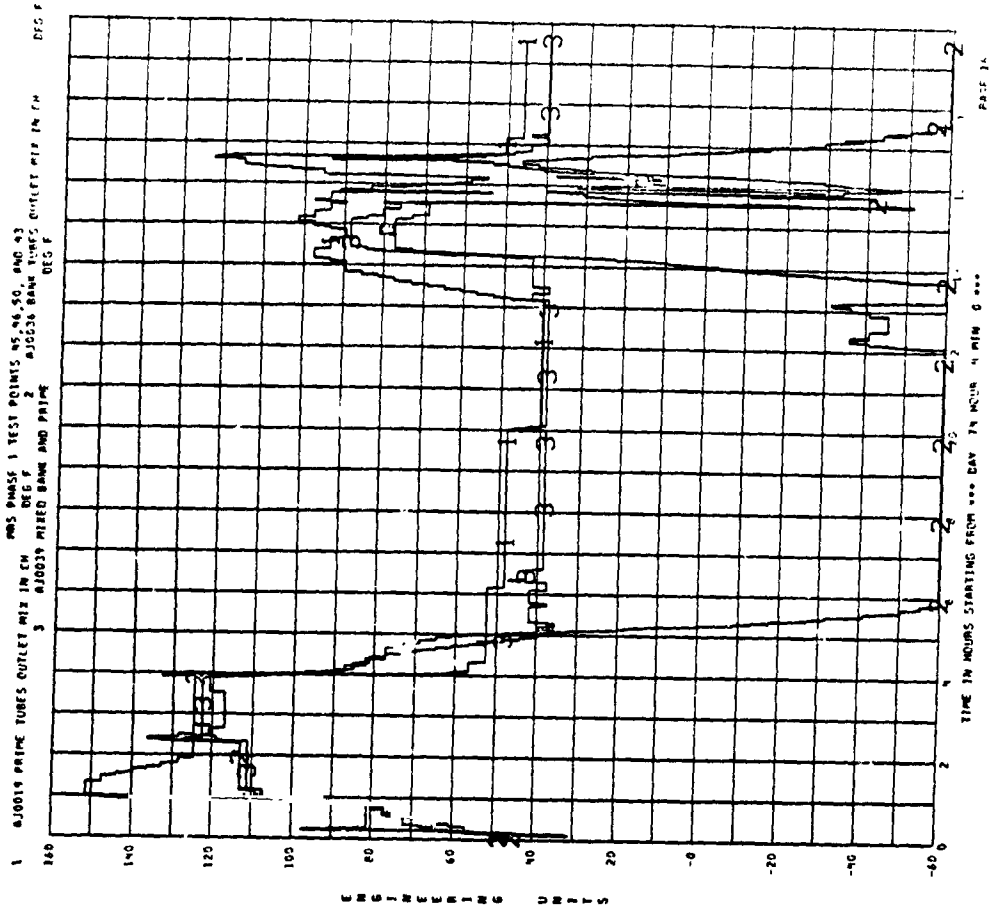
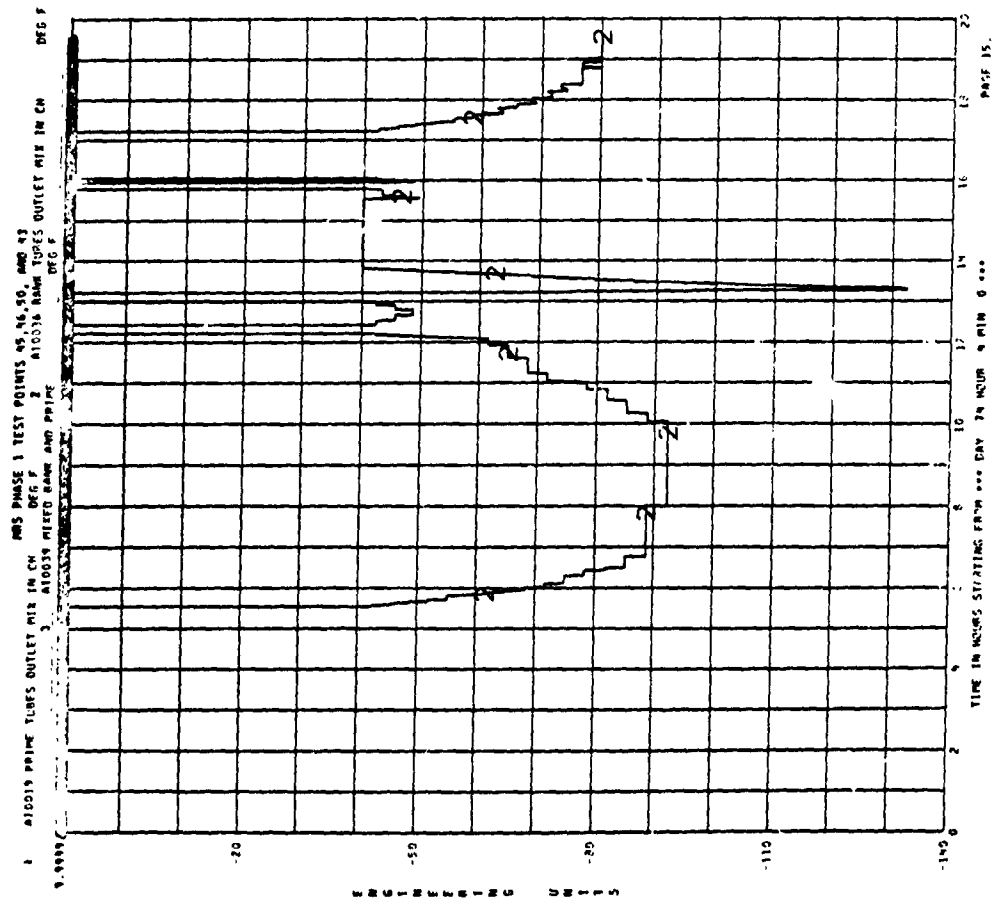


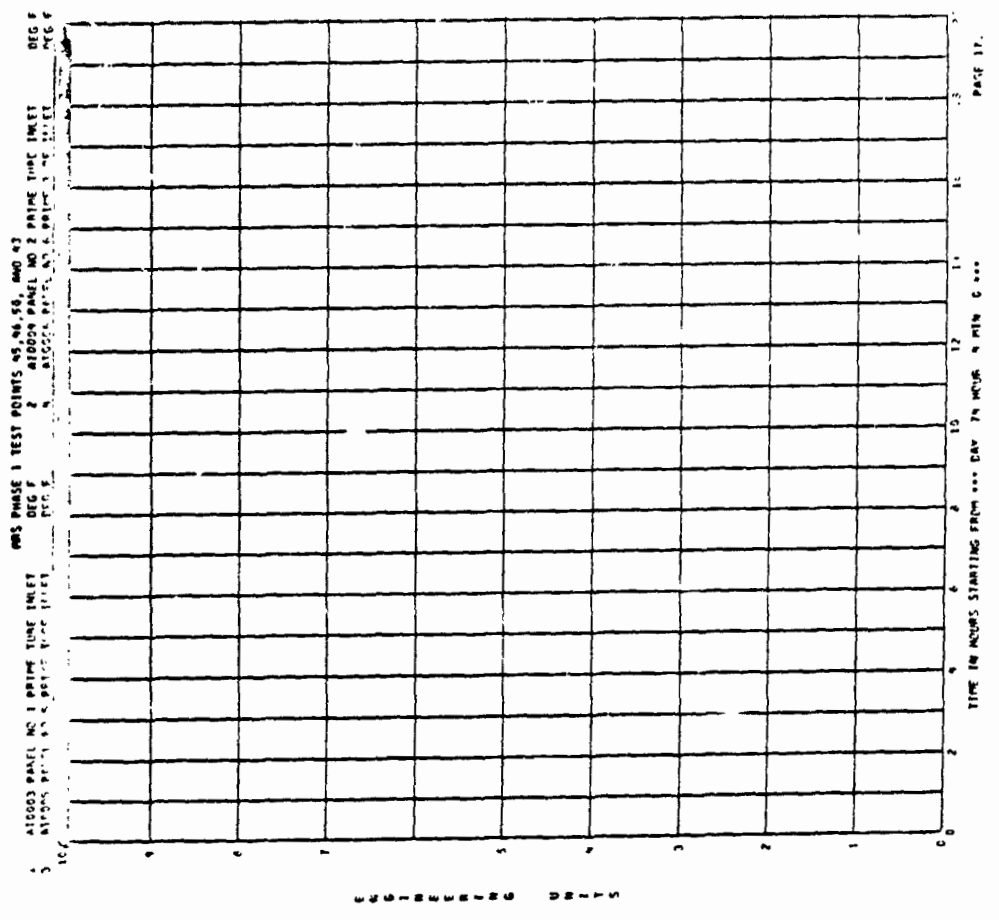
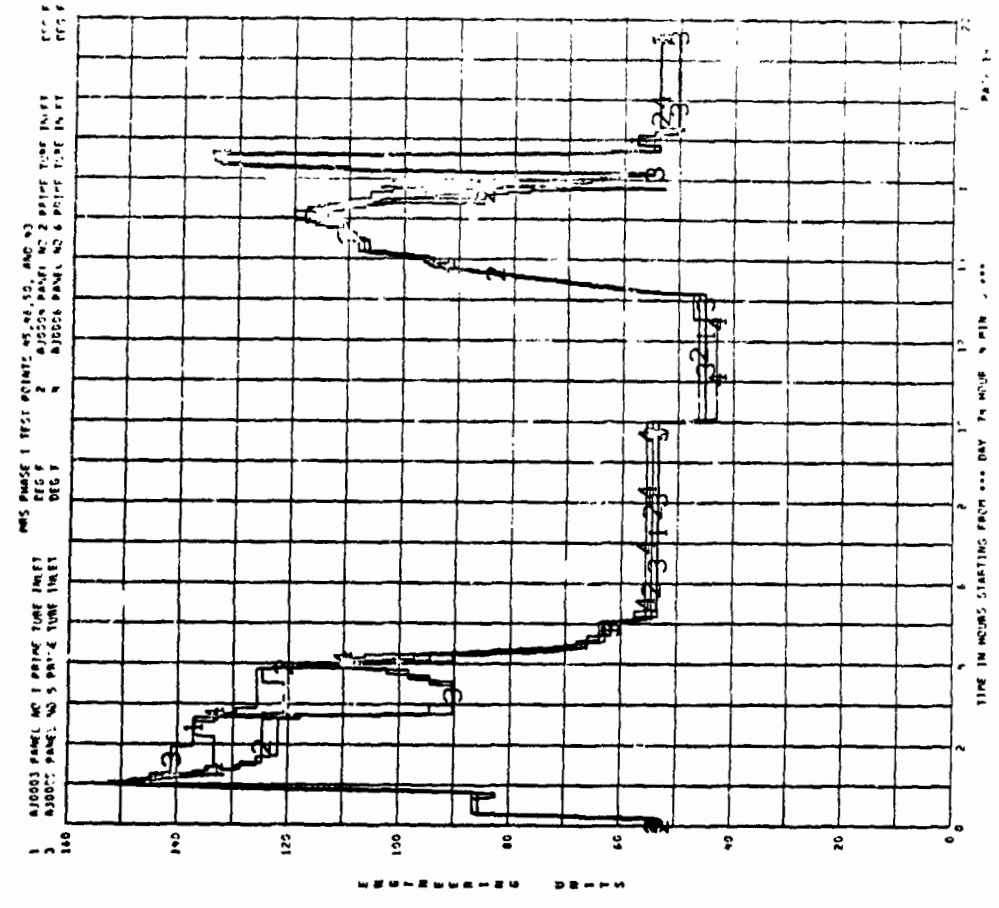
PAGE 13.

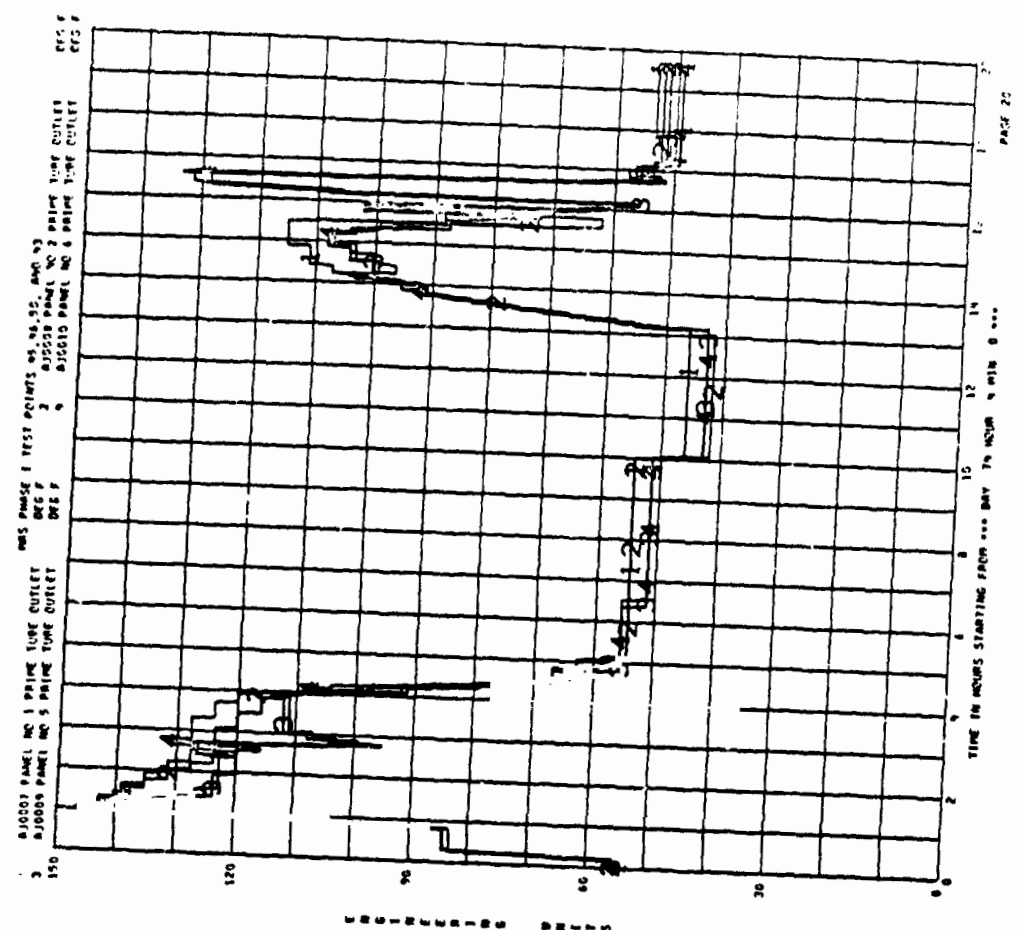
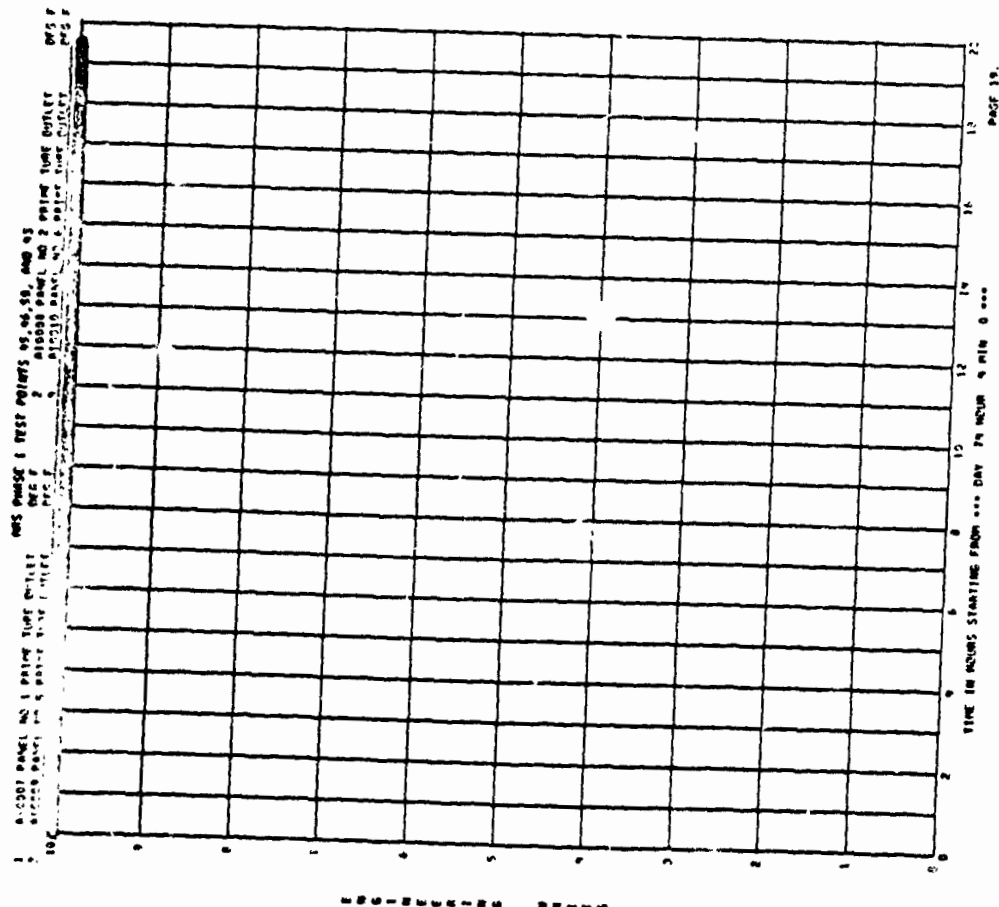
1 RMS PHASE 1 TEST POINTS 45, 46, 50, AND 53
ADJ002 BAKK SYSTEM INLET DEG F

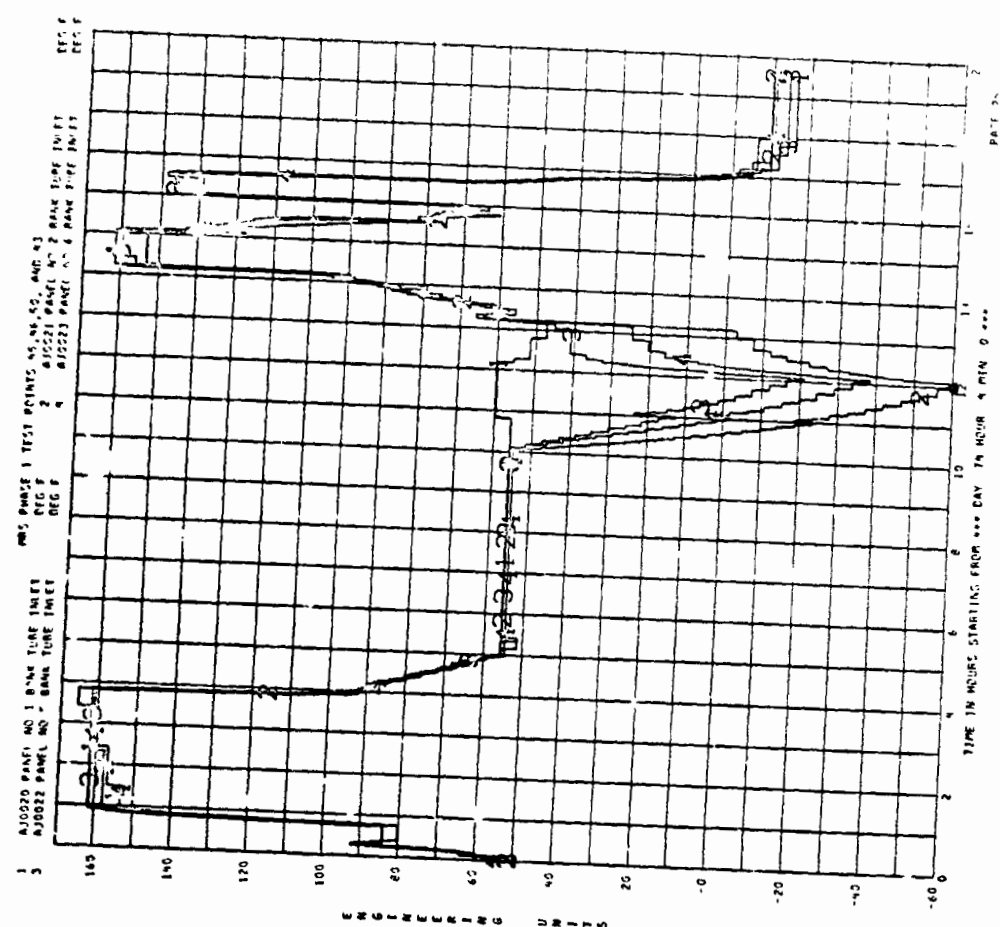
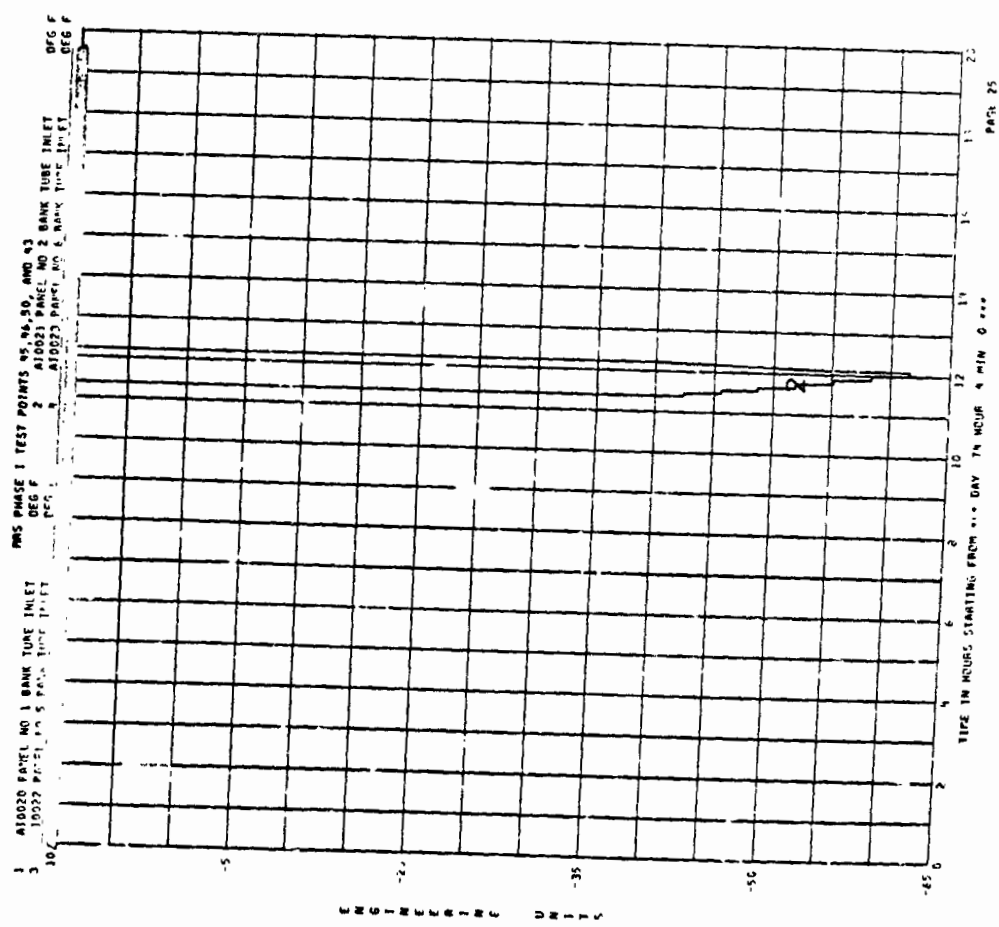


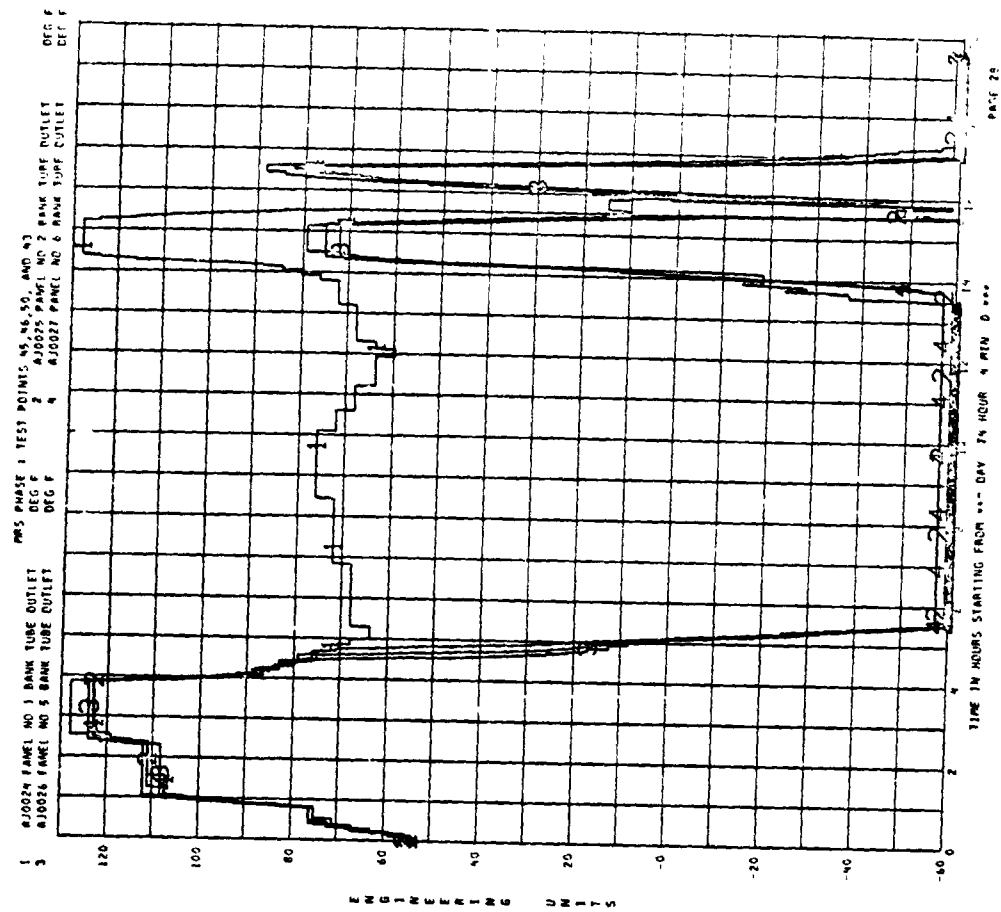
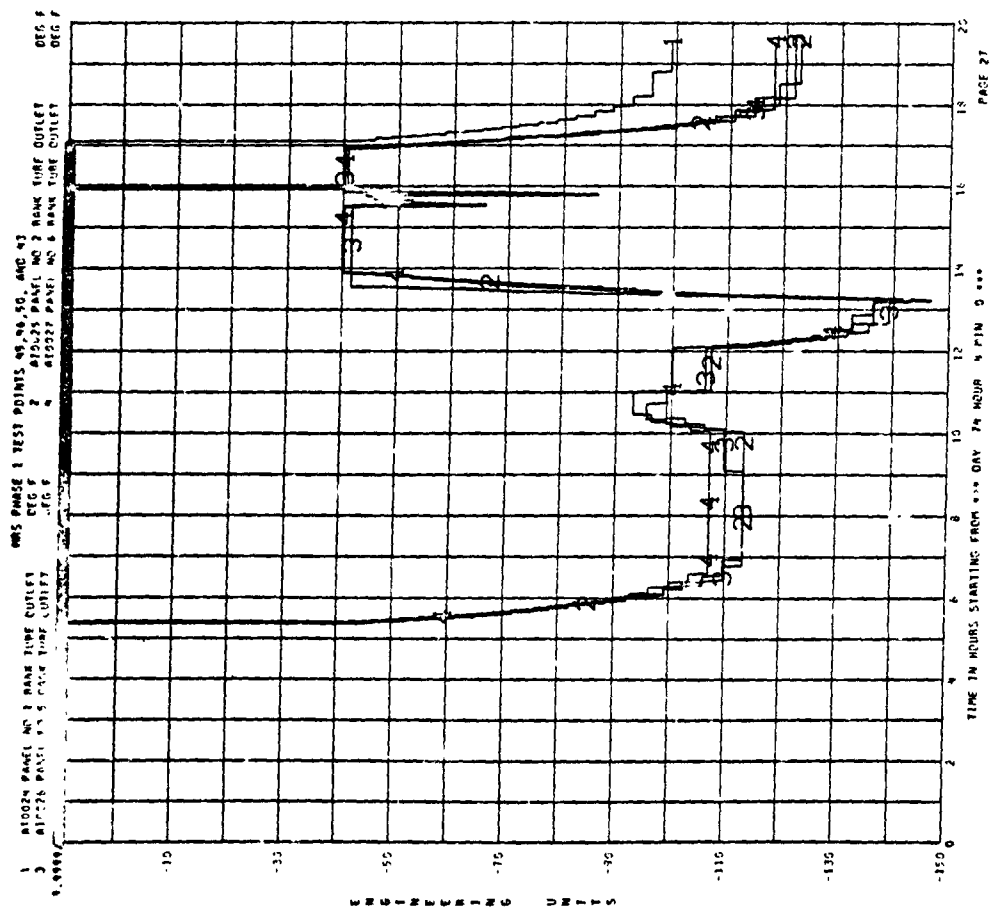
PAGE 14.

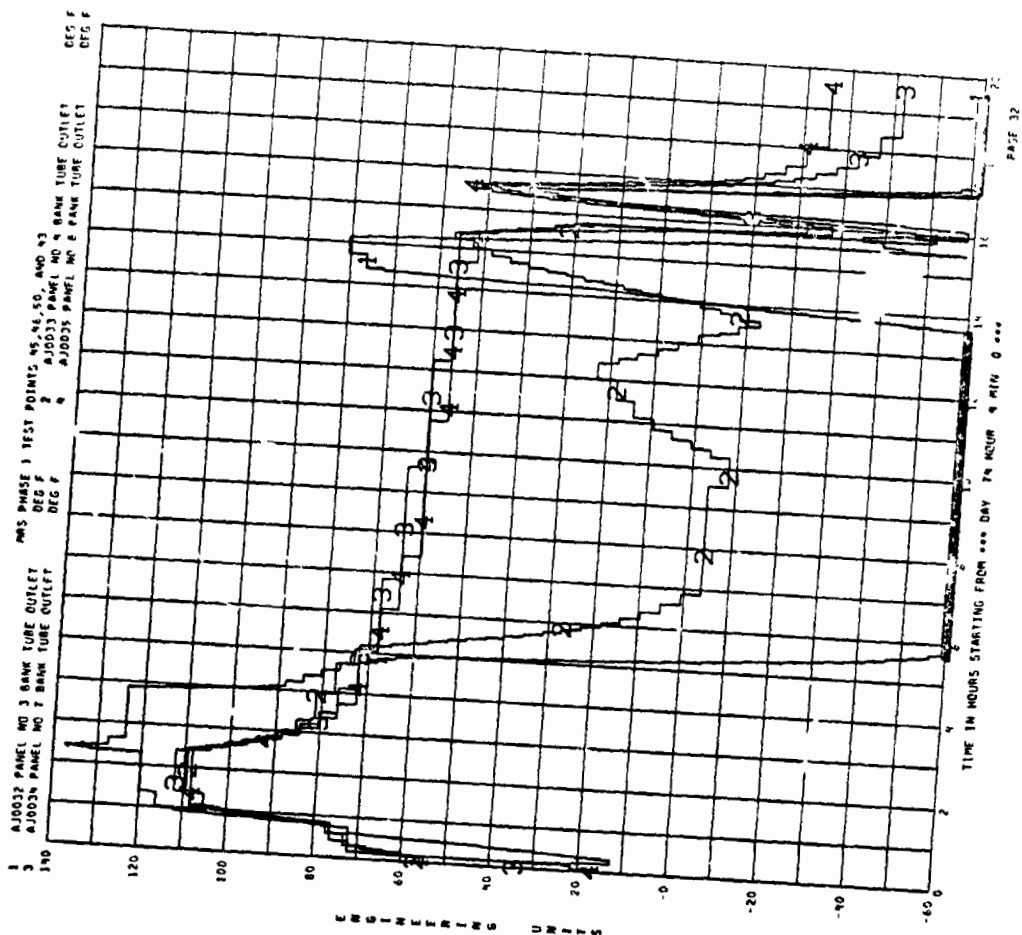
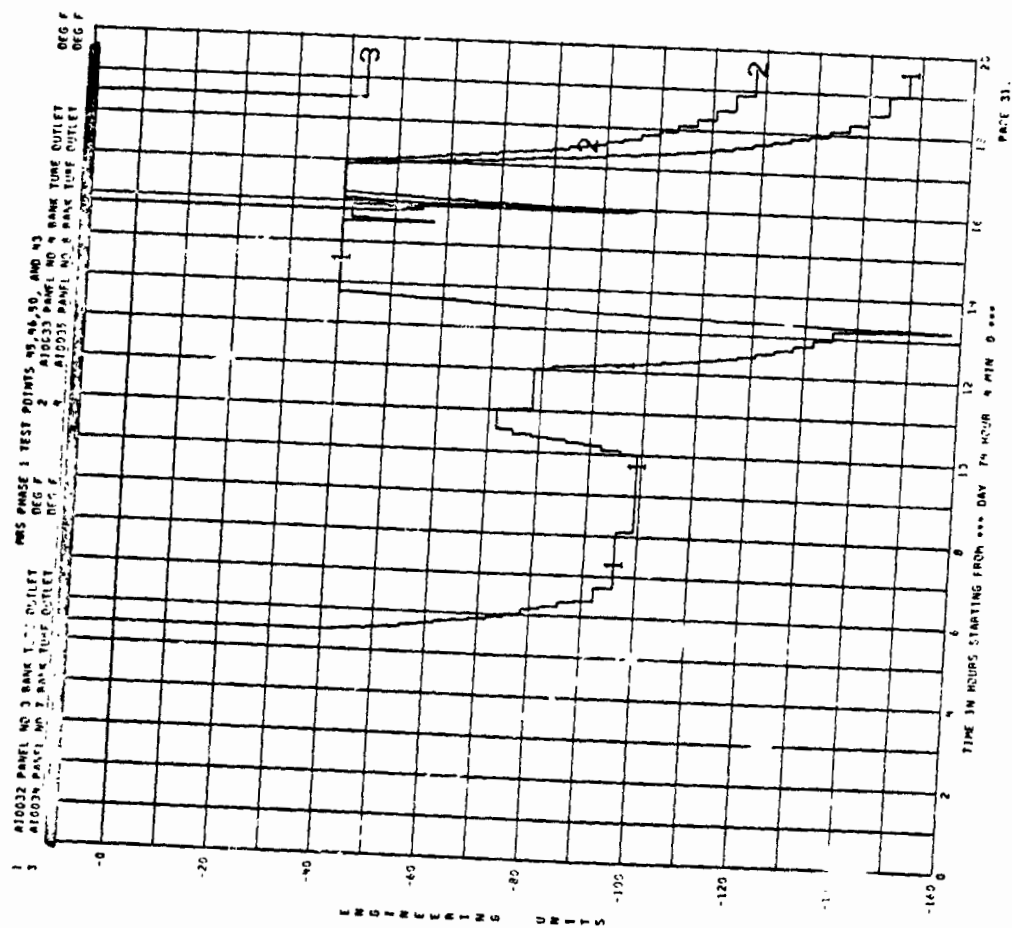


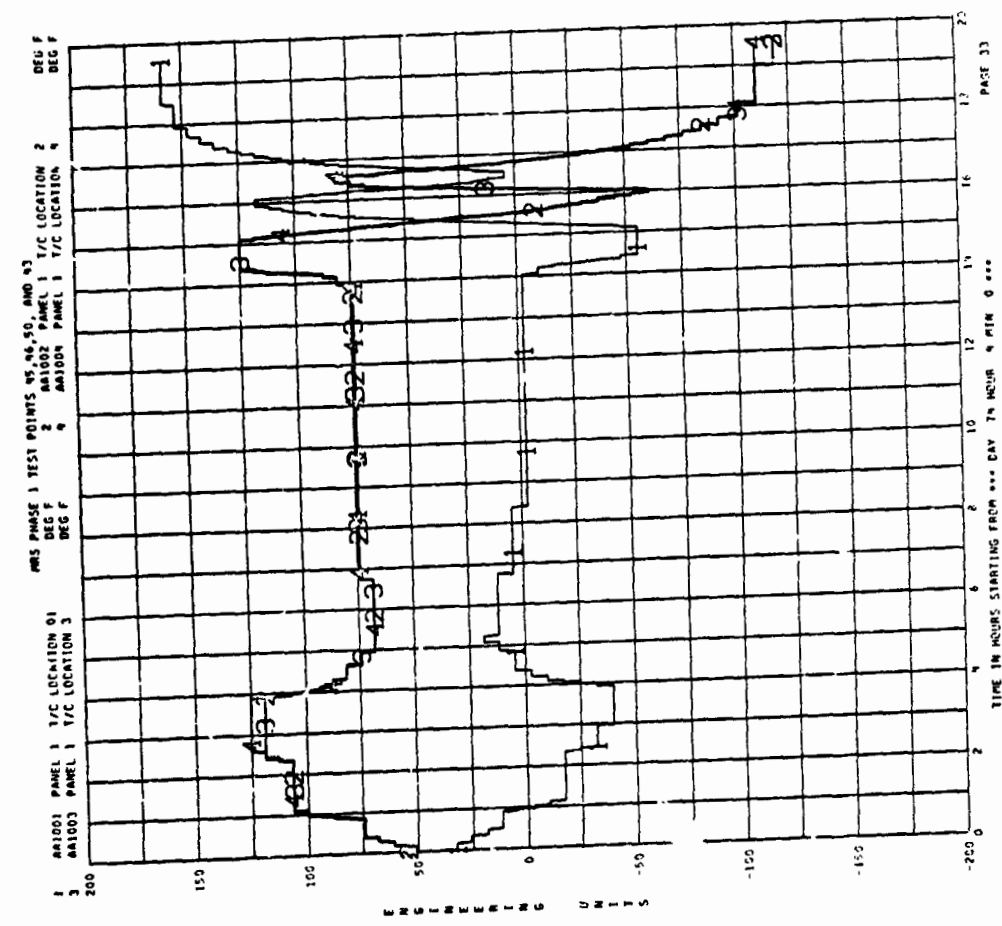
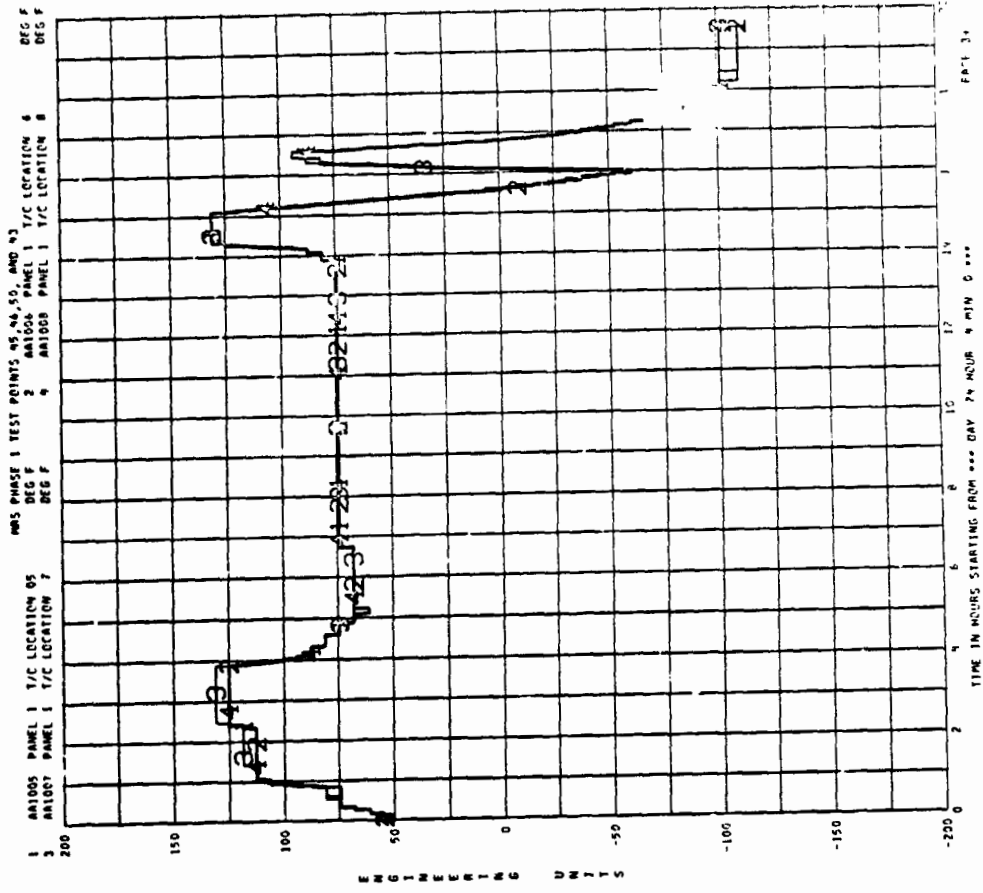


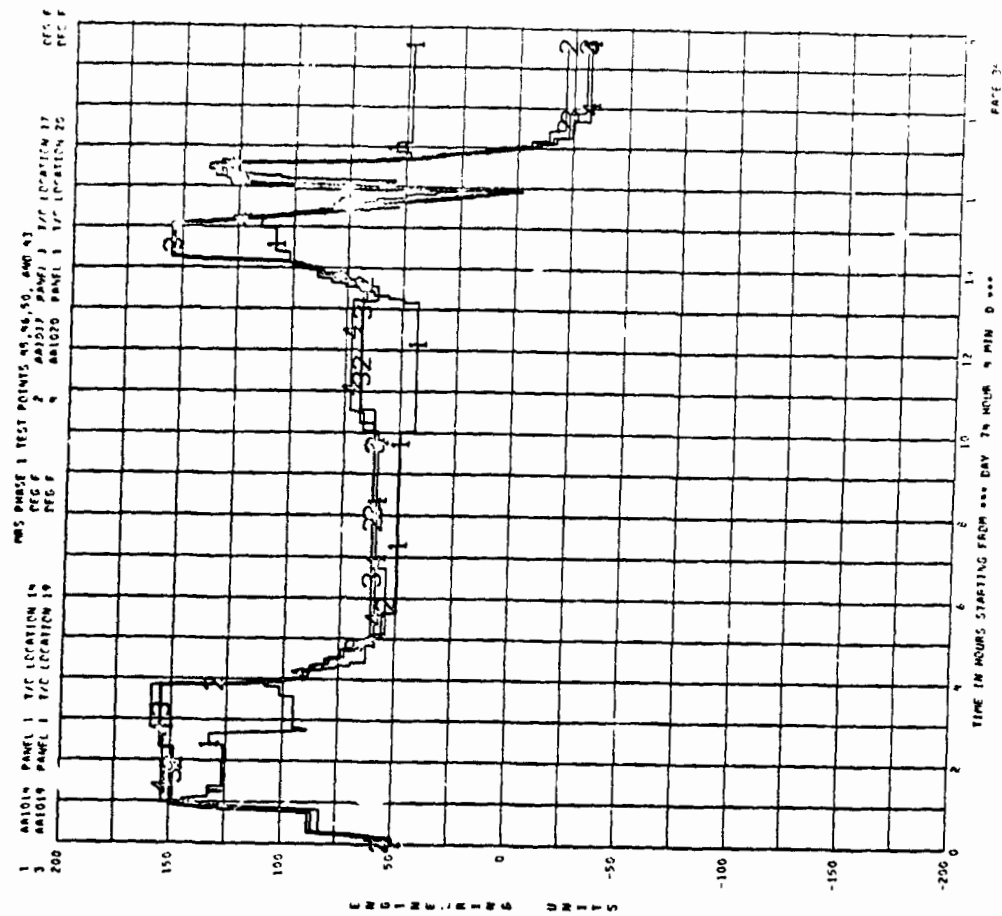
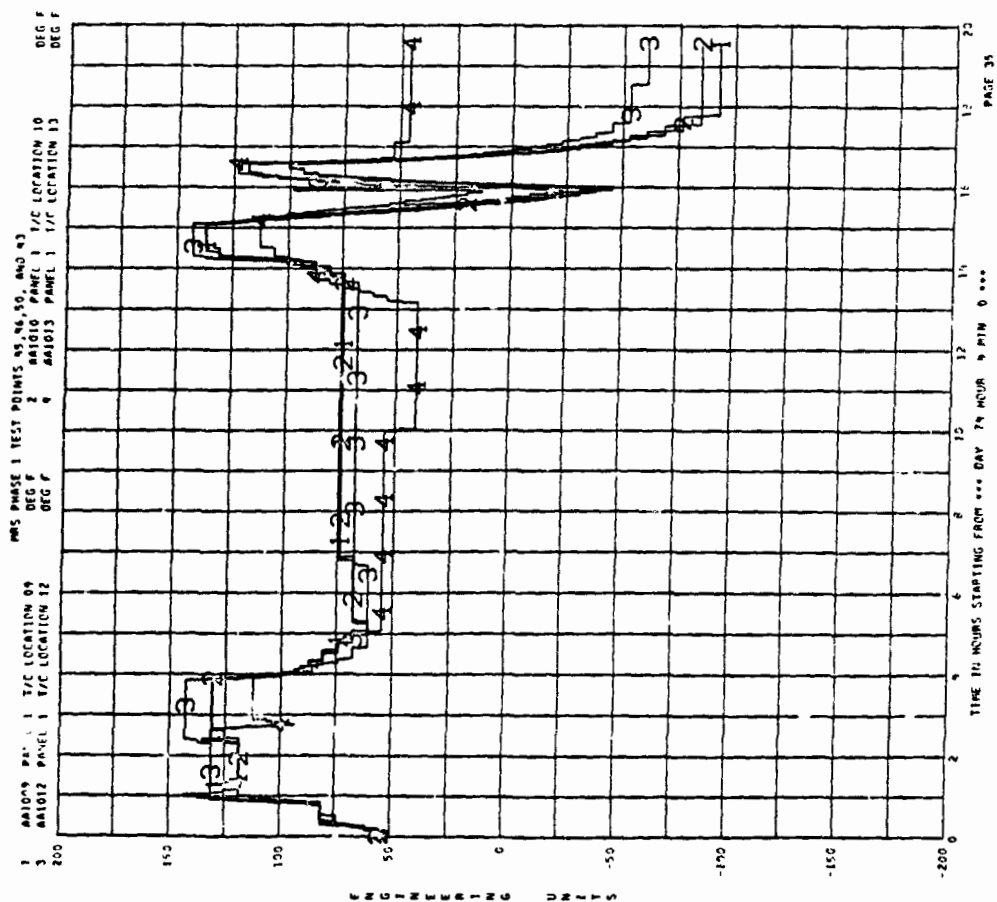


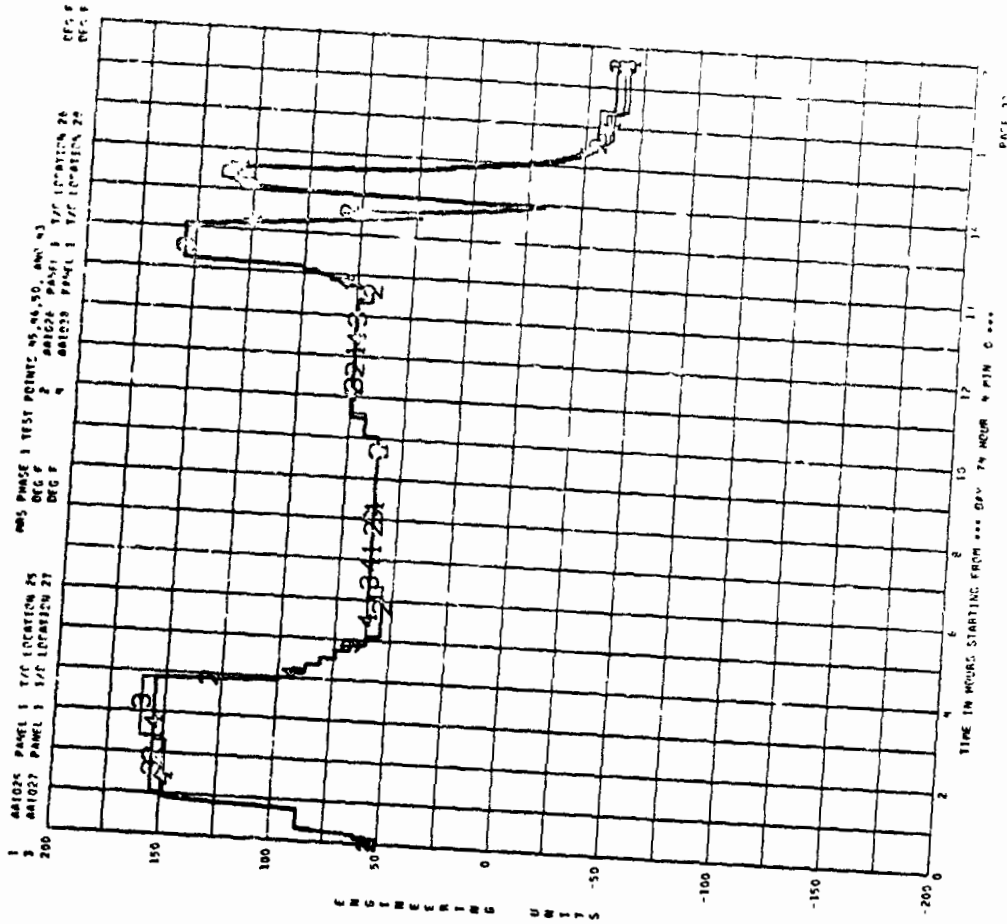
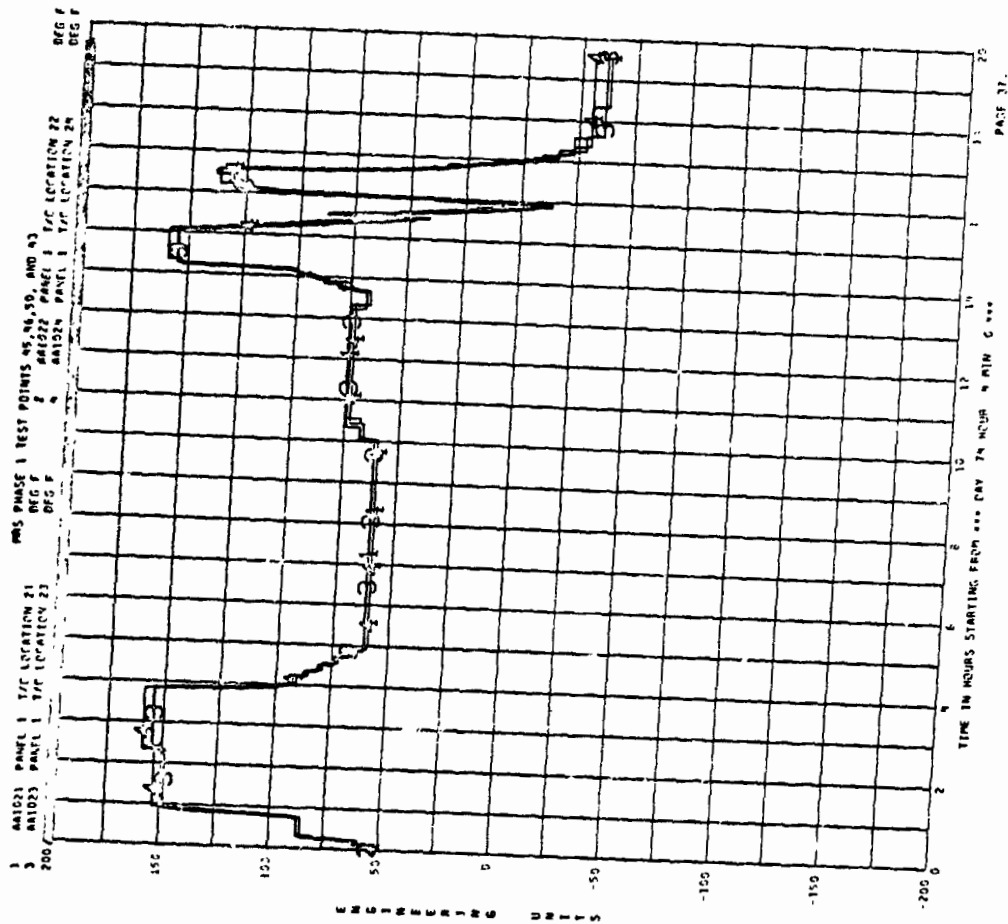


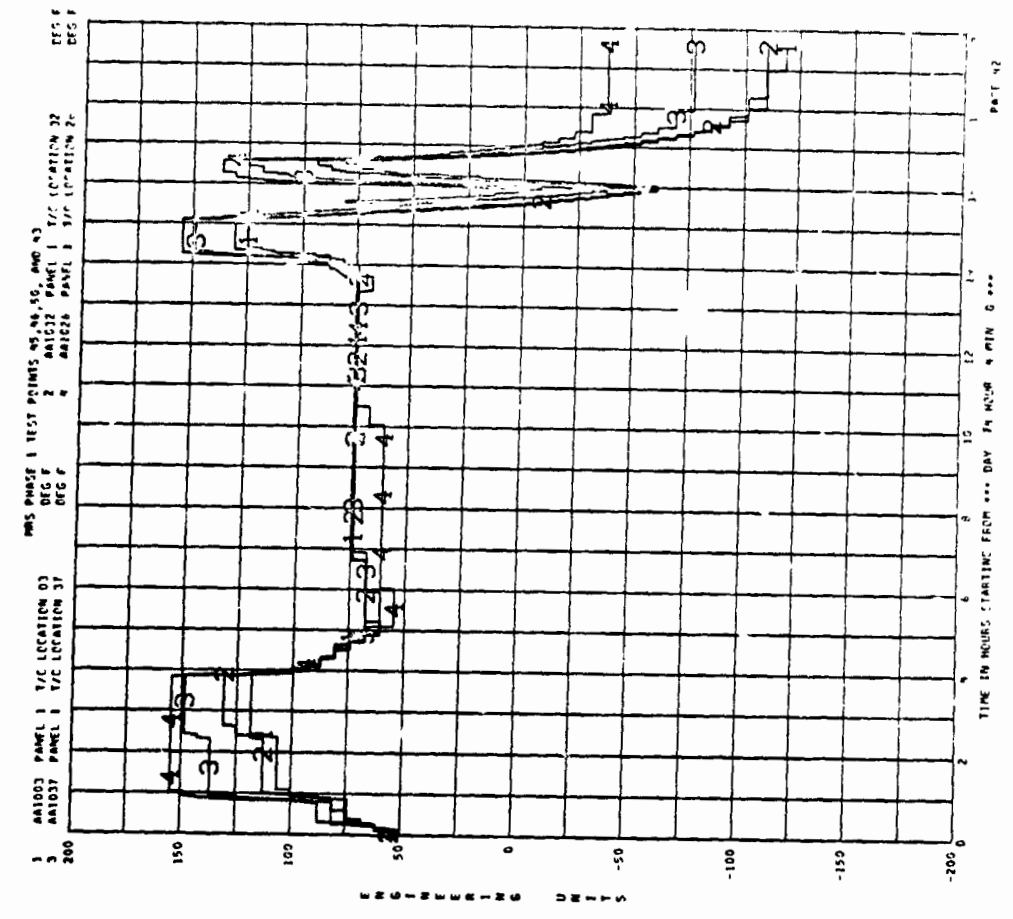
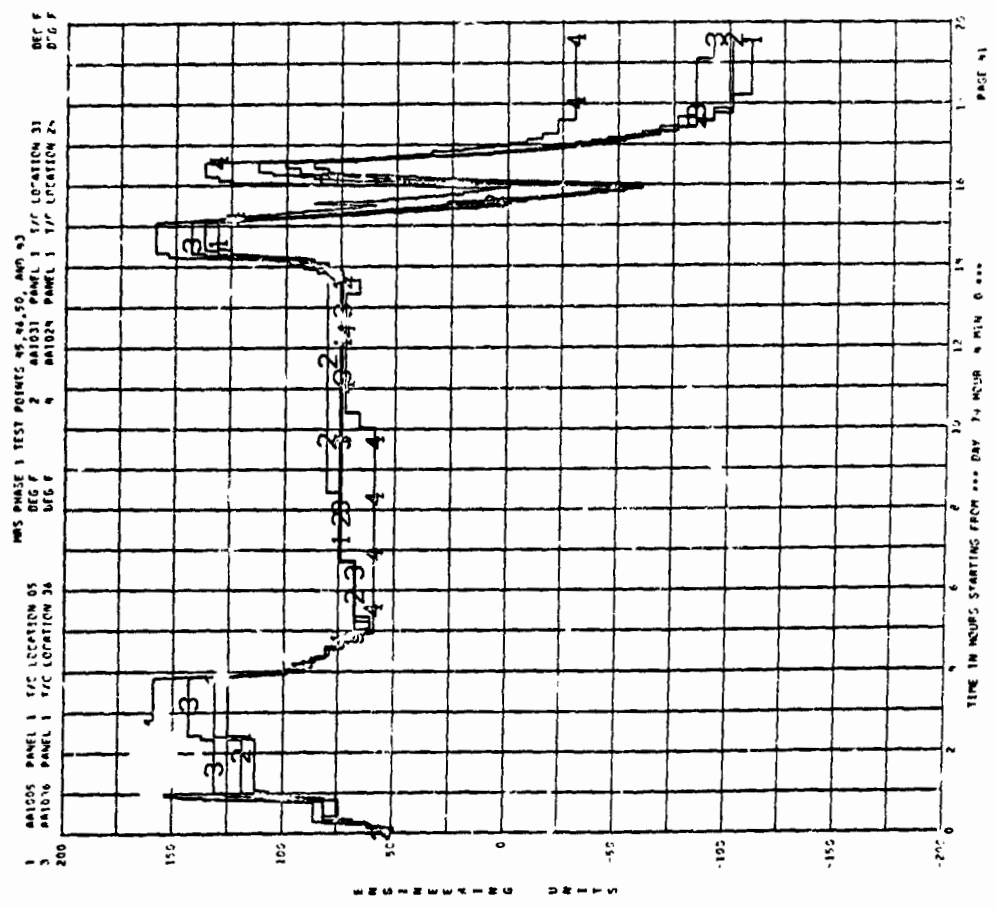


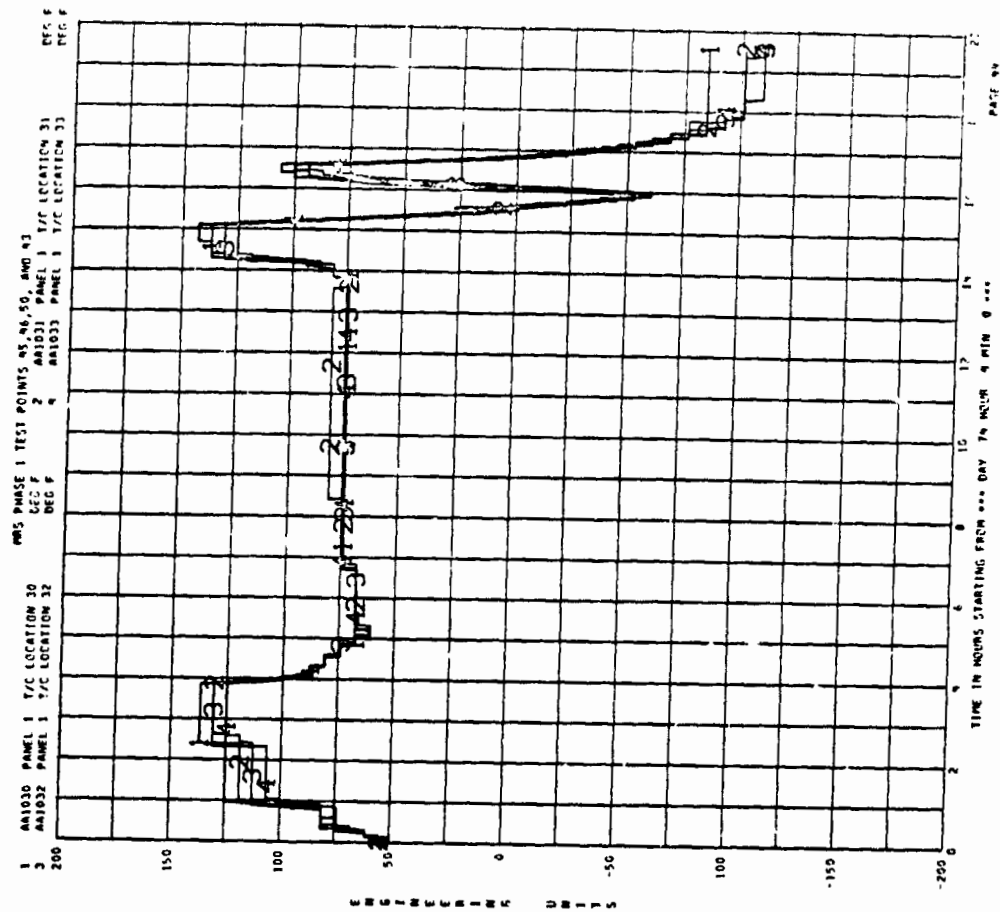
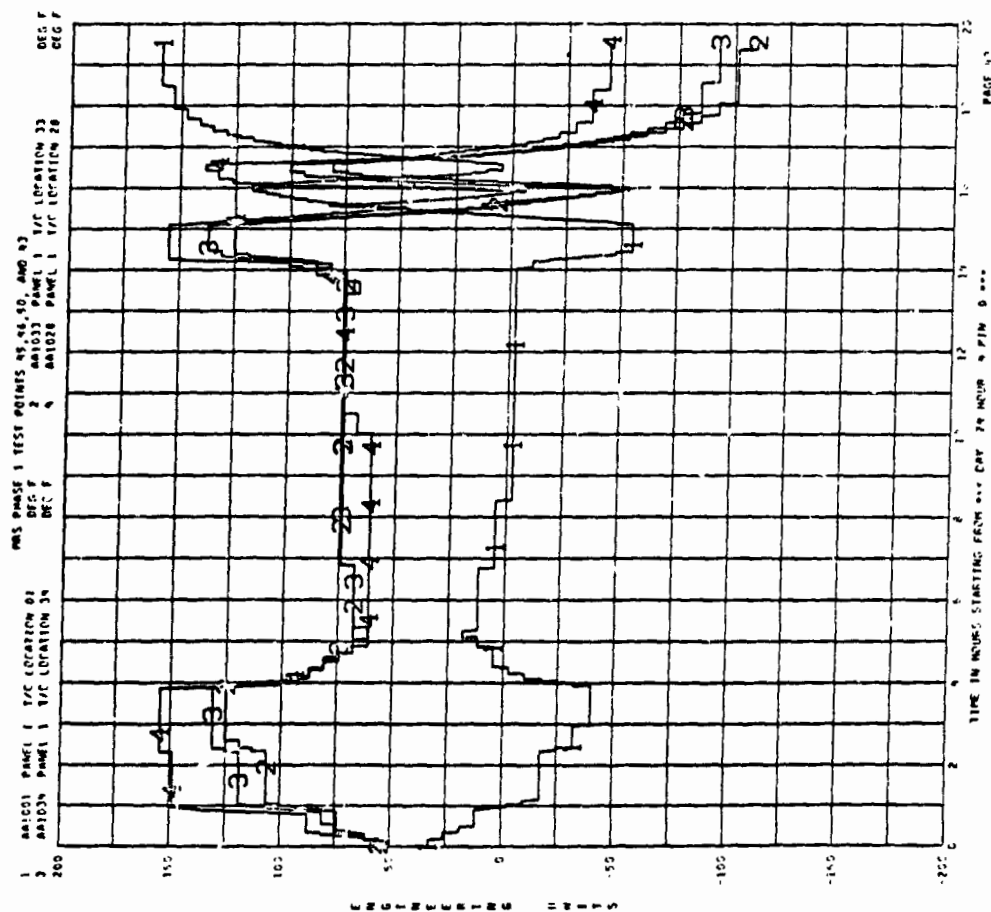


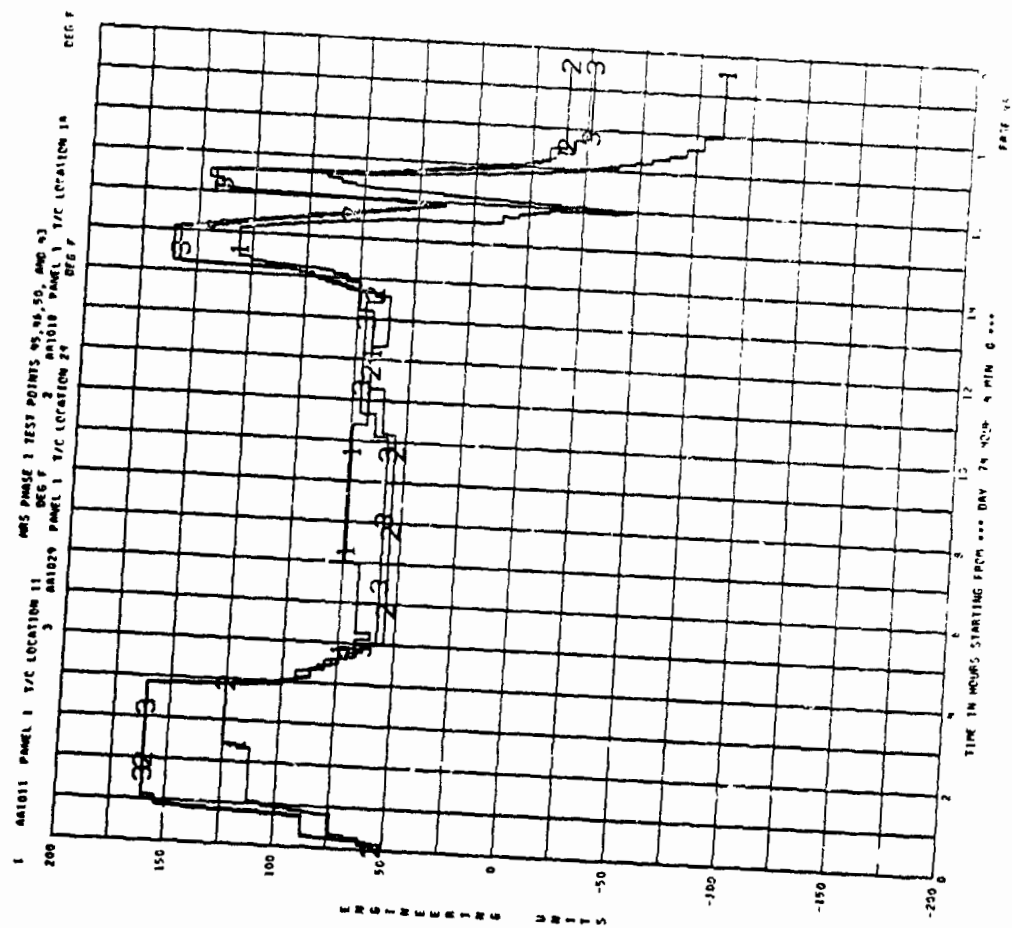
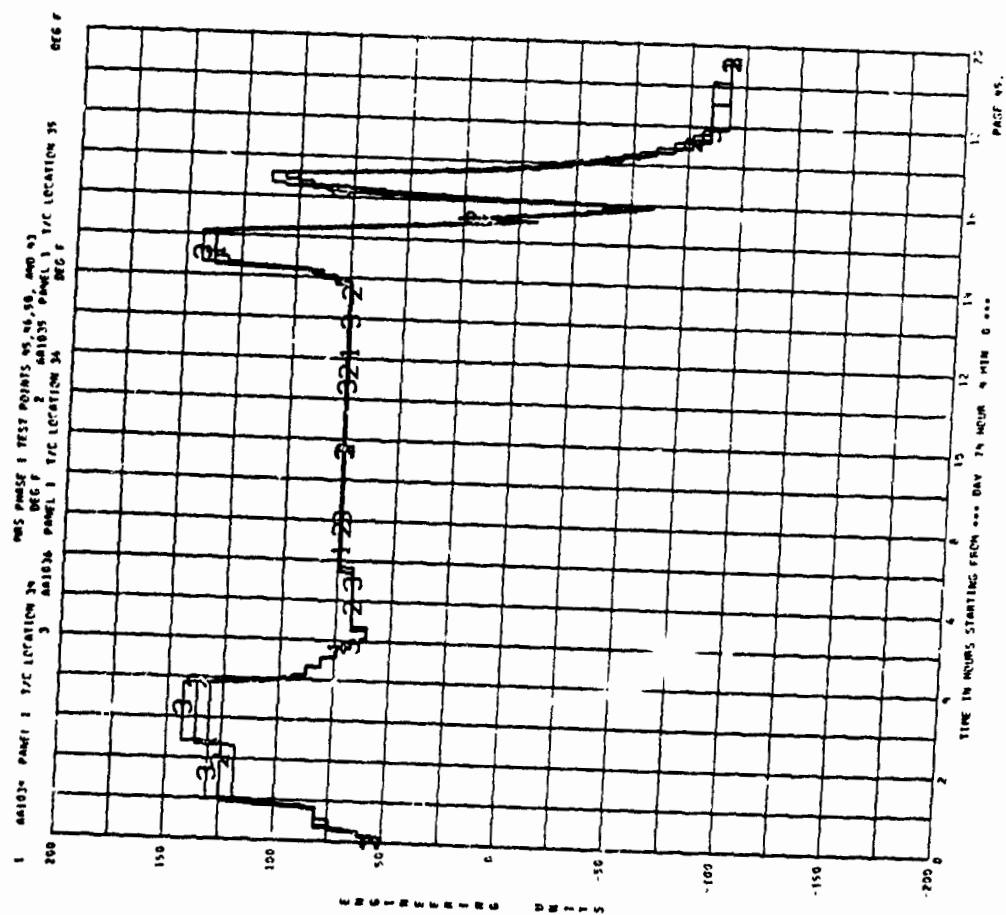


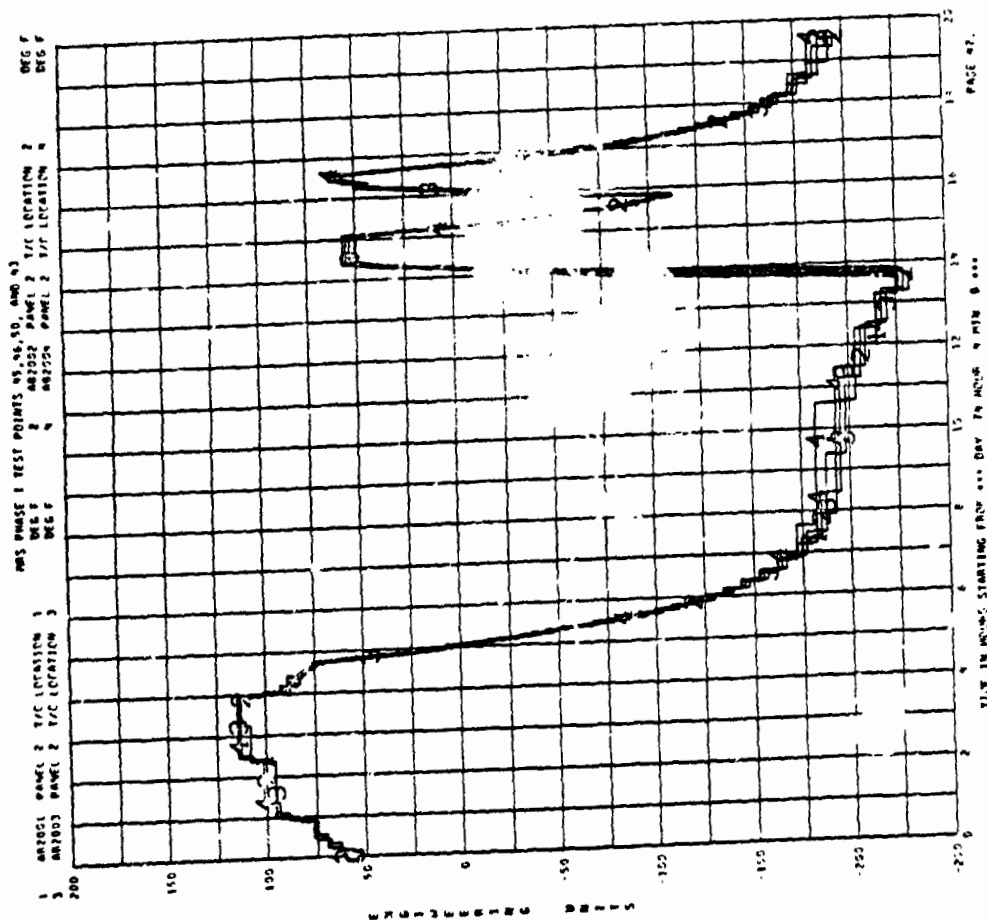
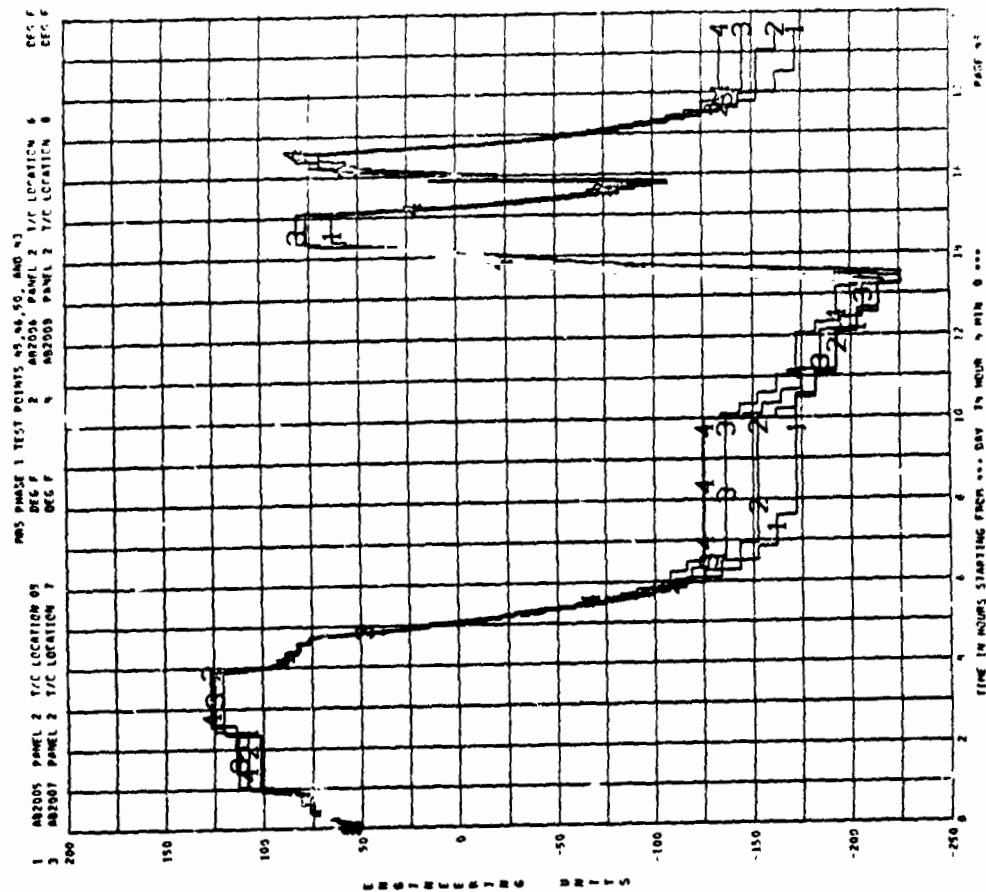


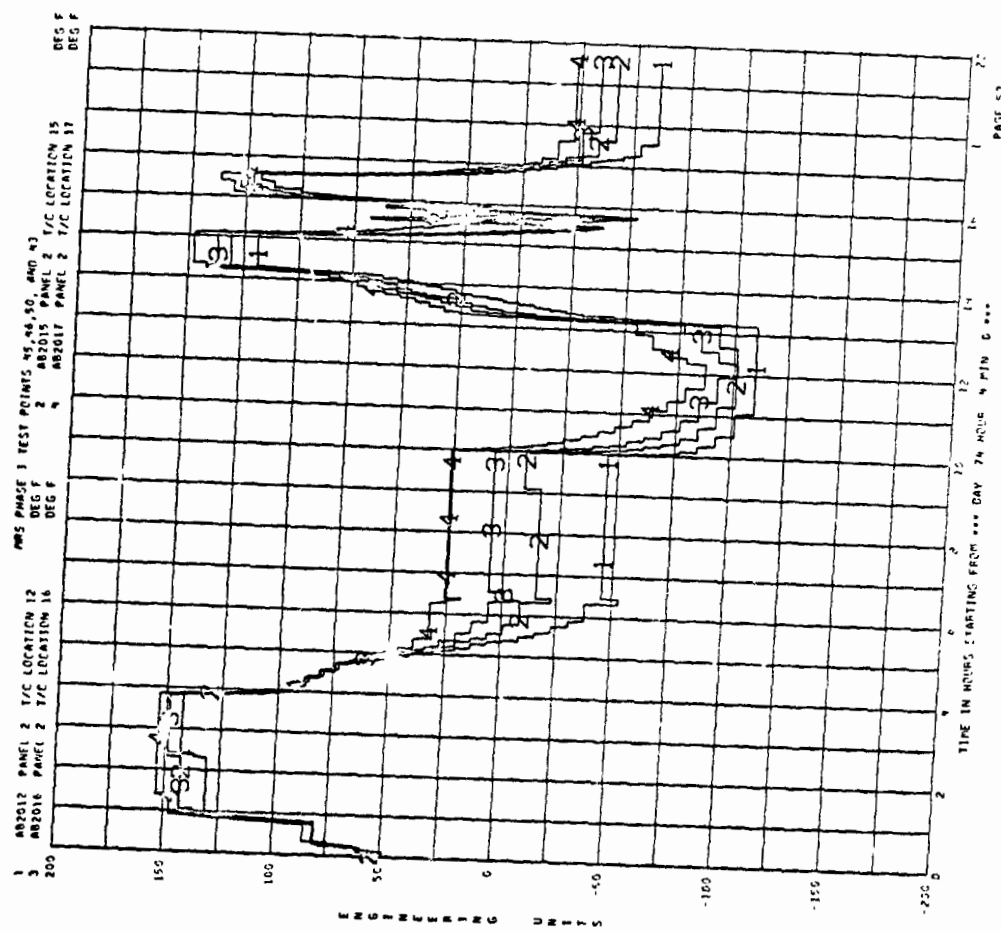


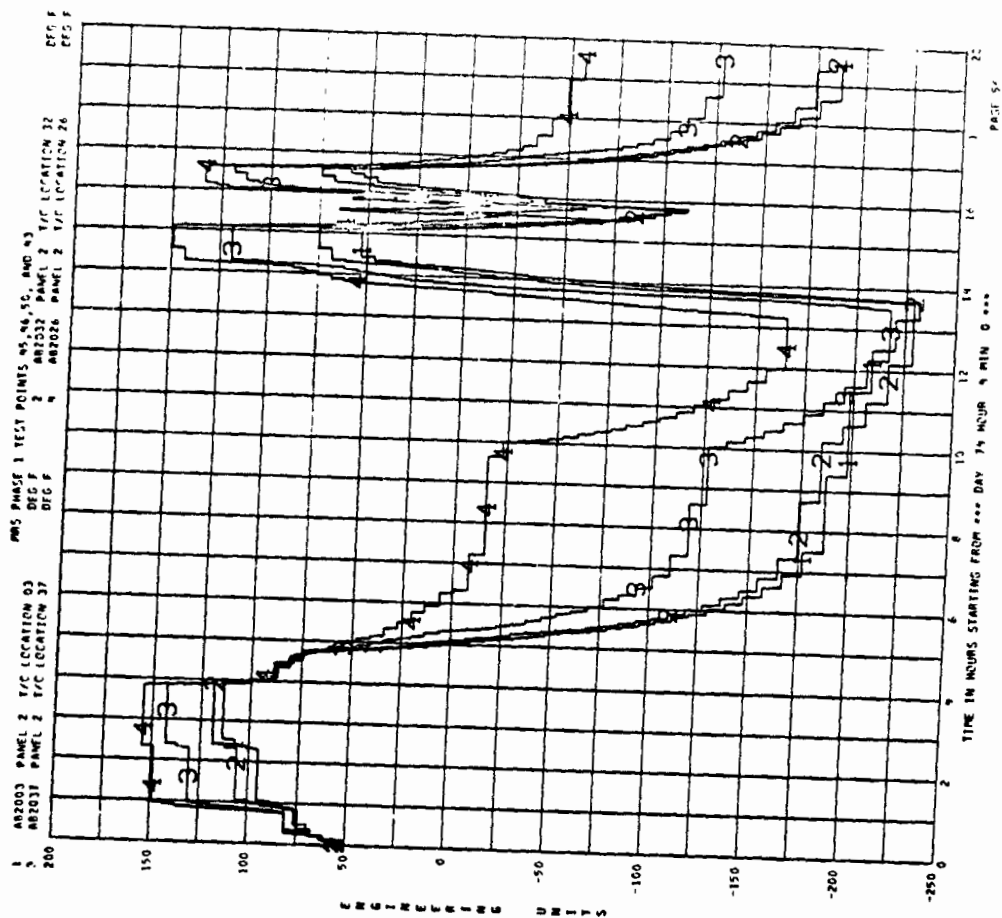
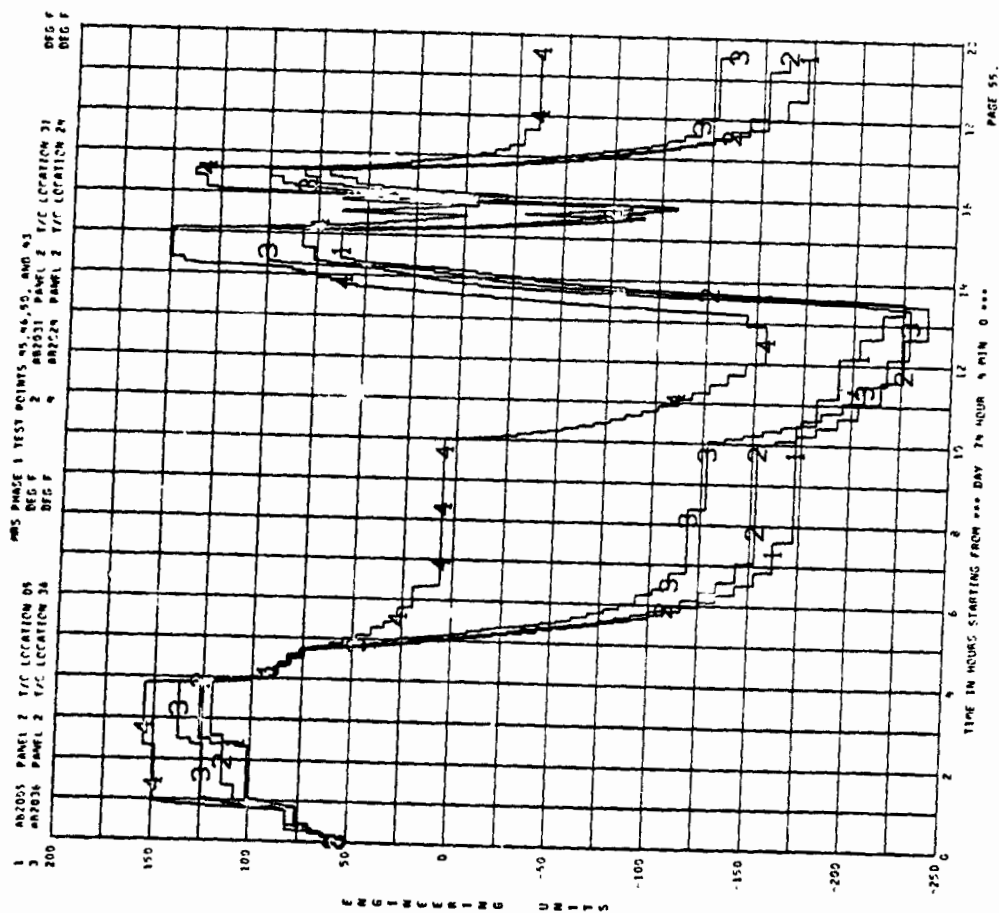


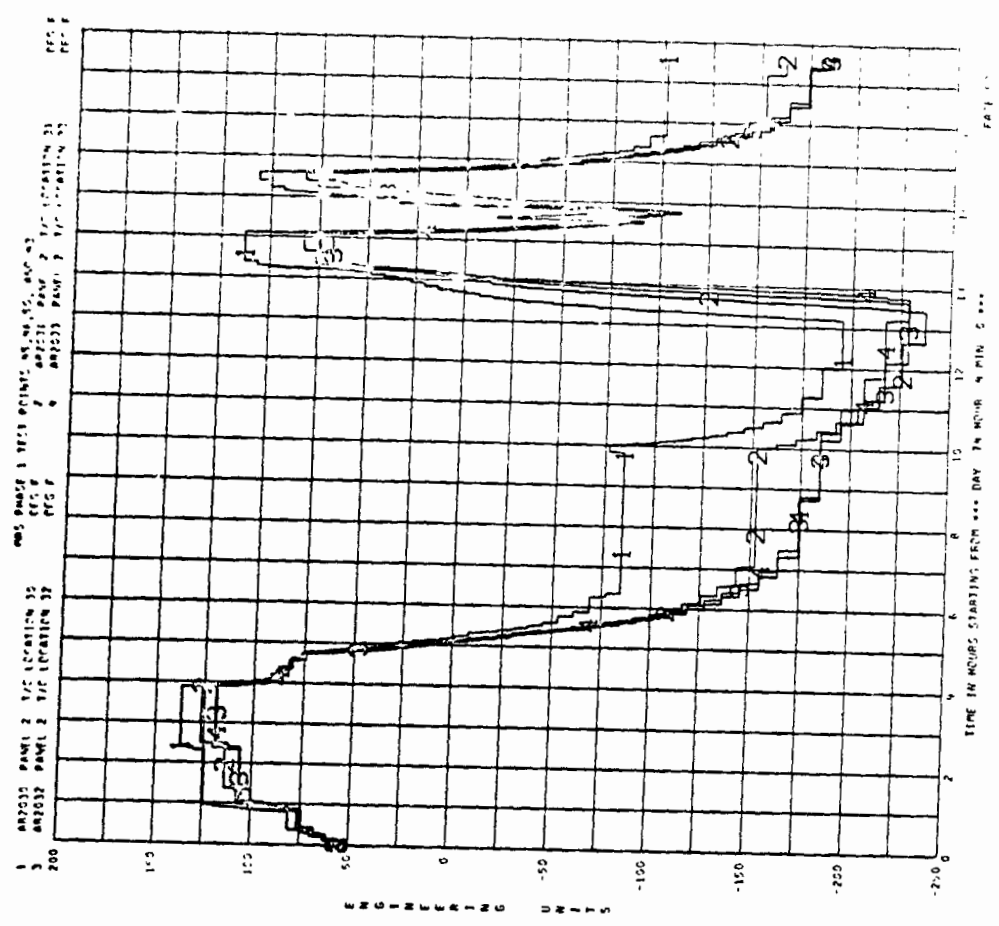
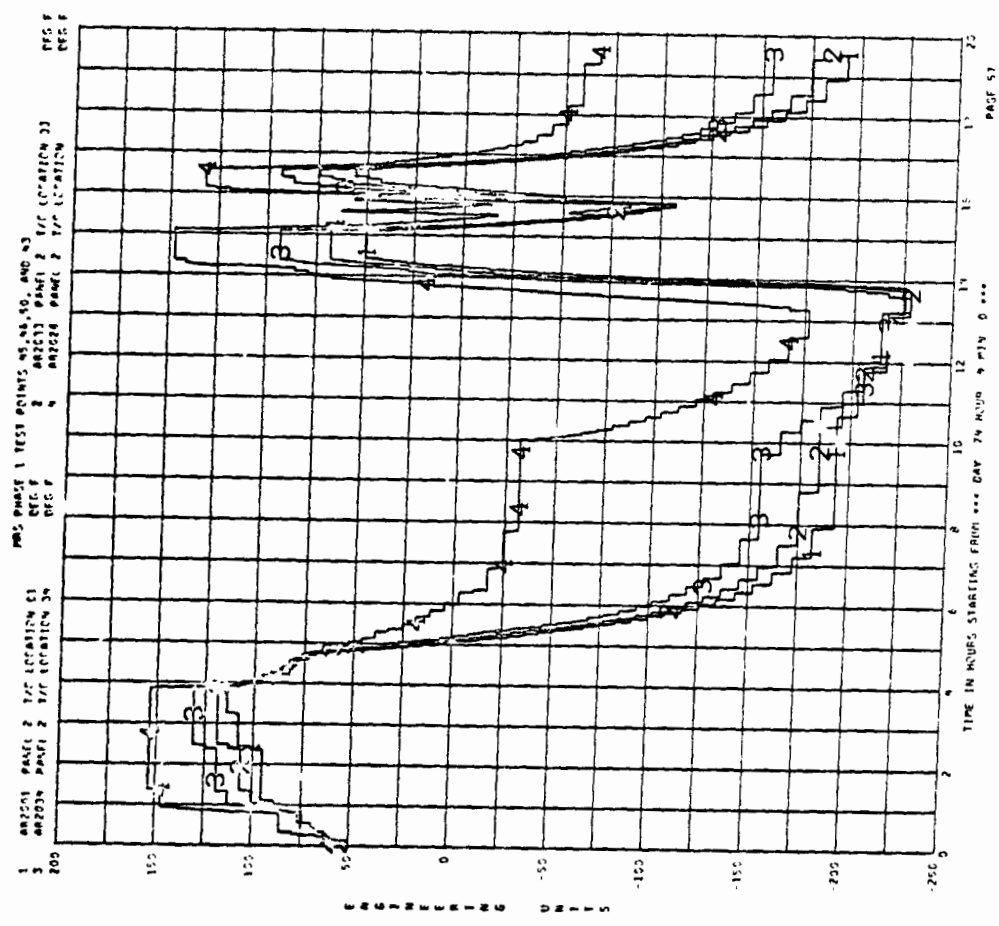


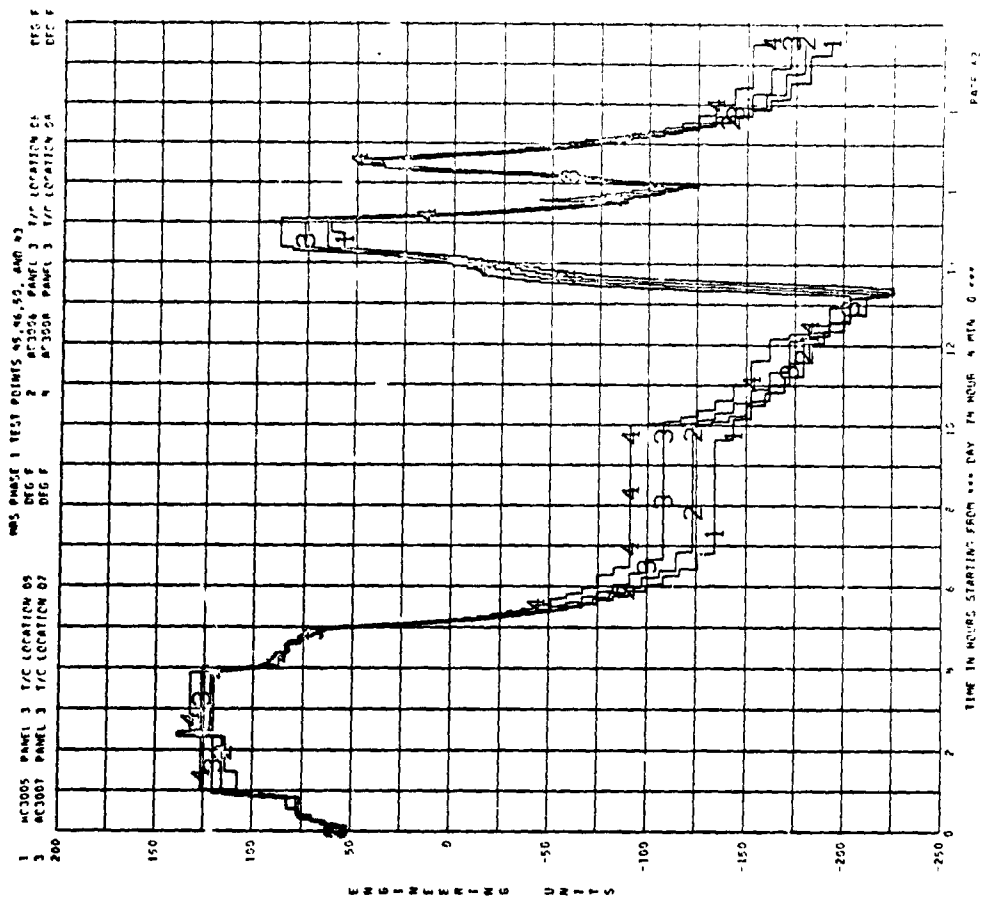
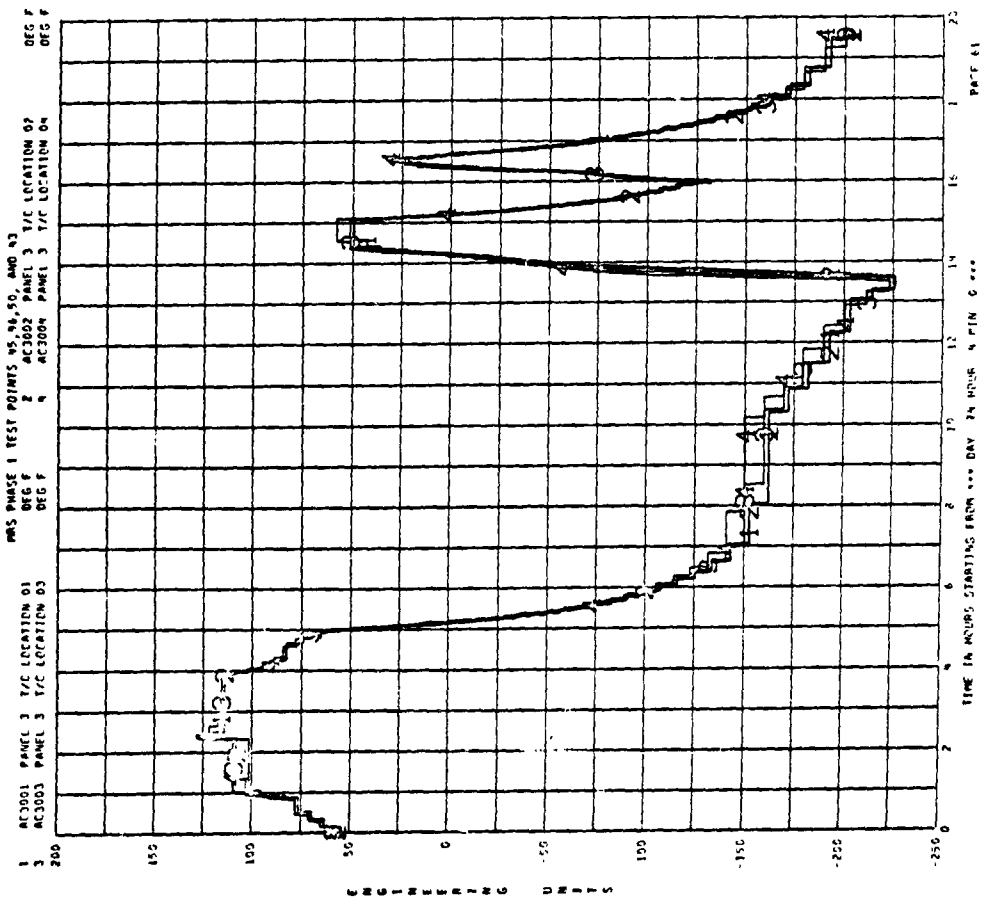


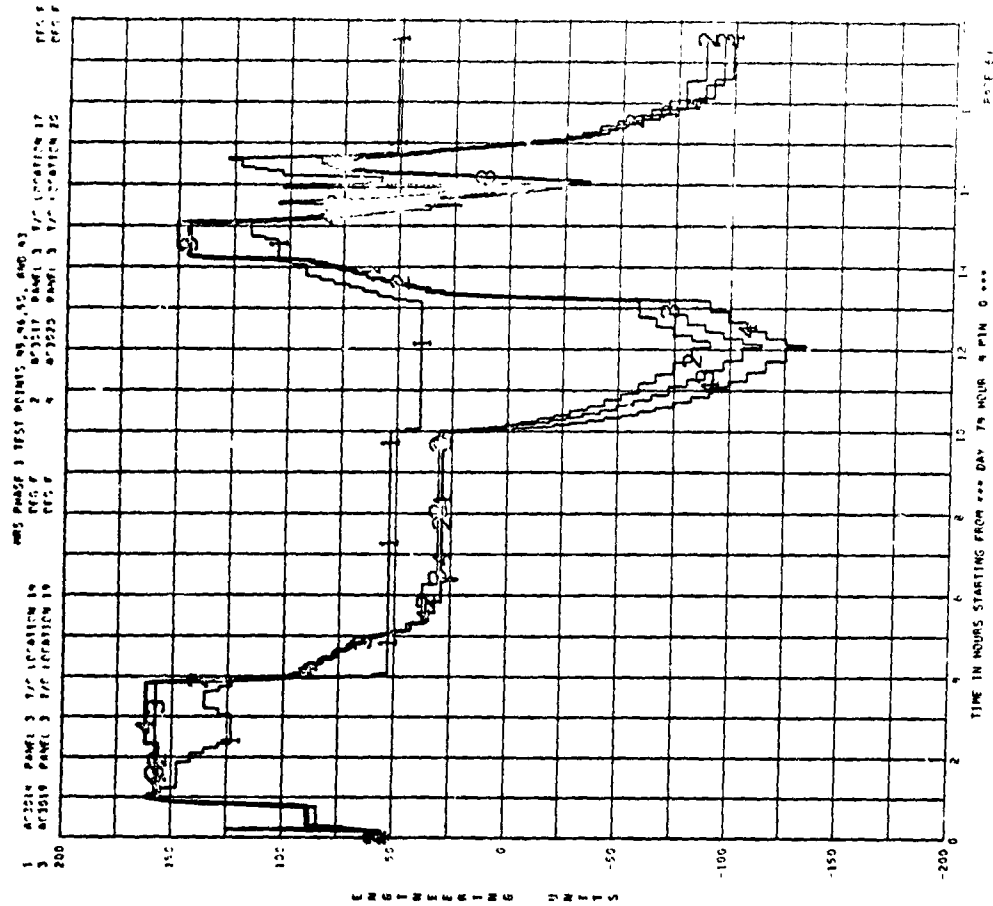
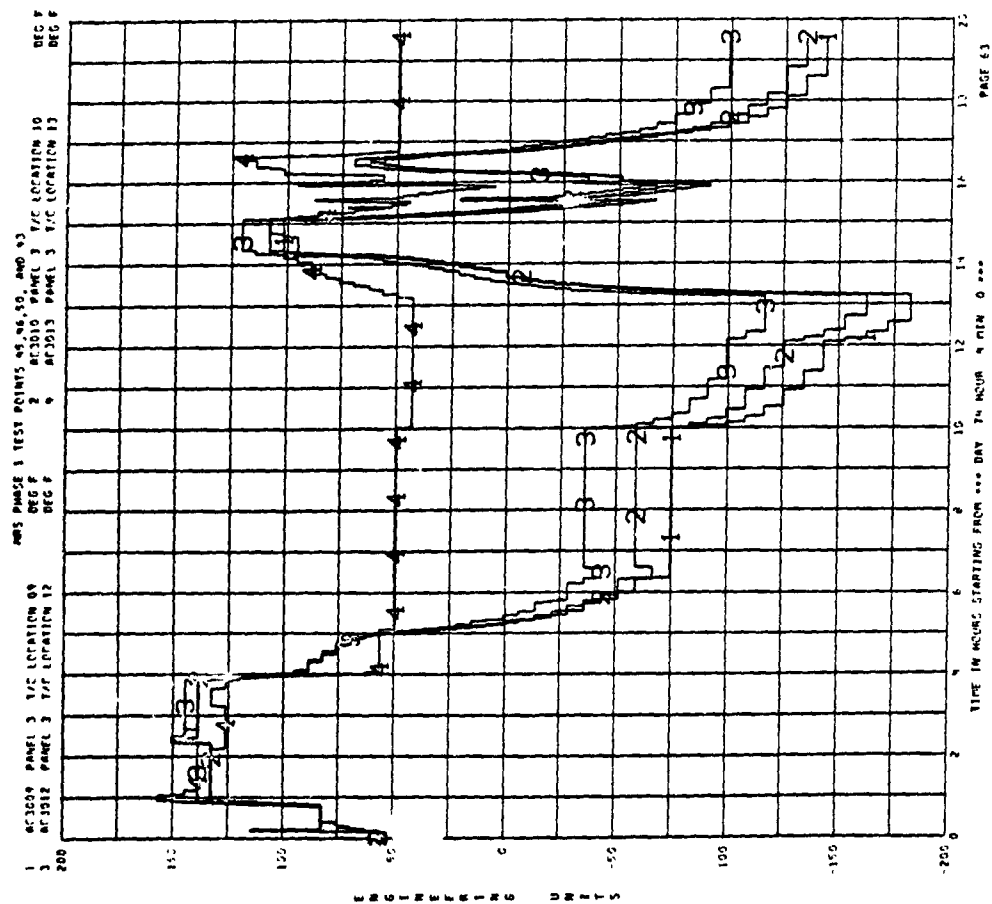


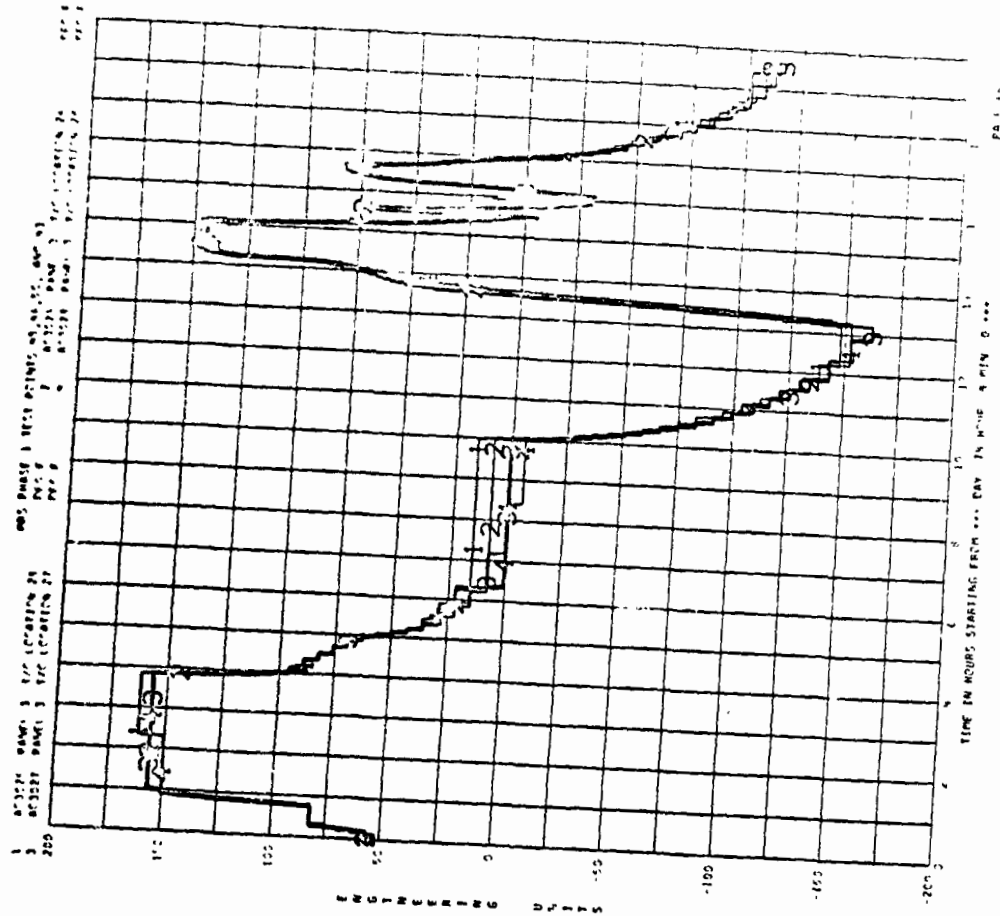
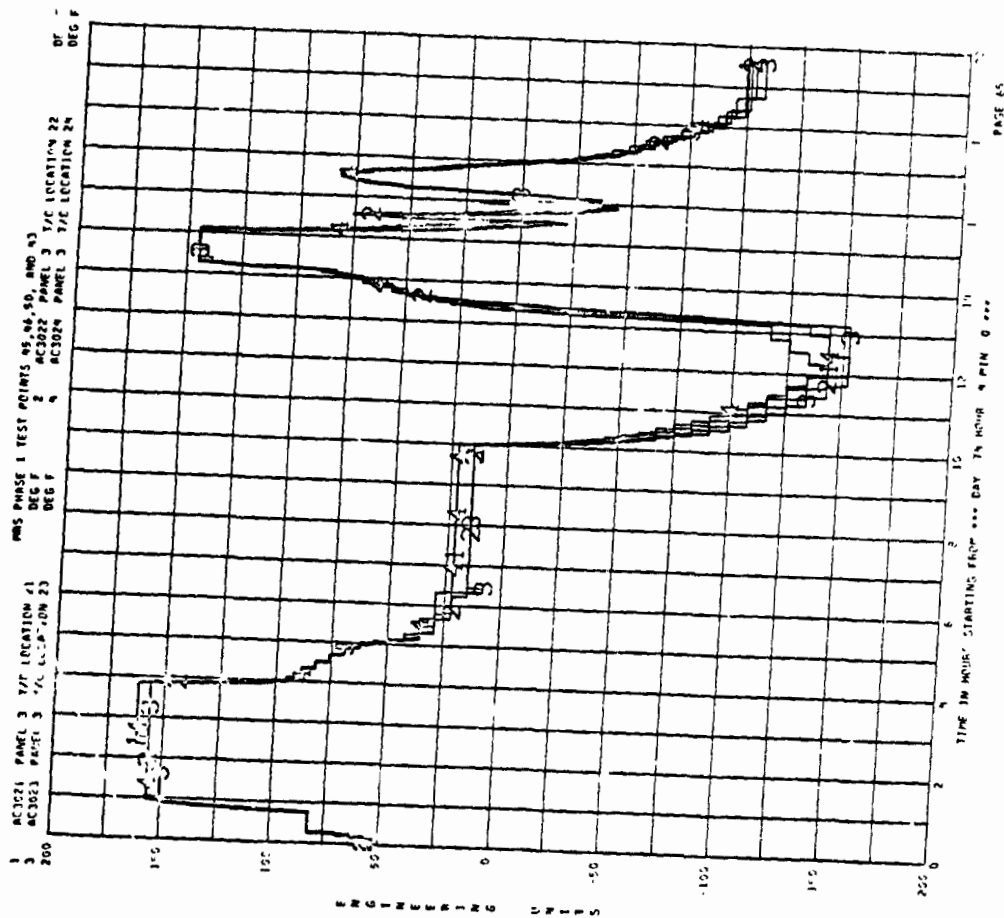


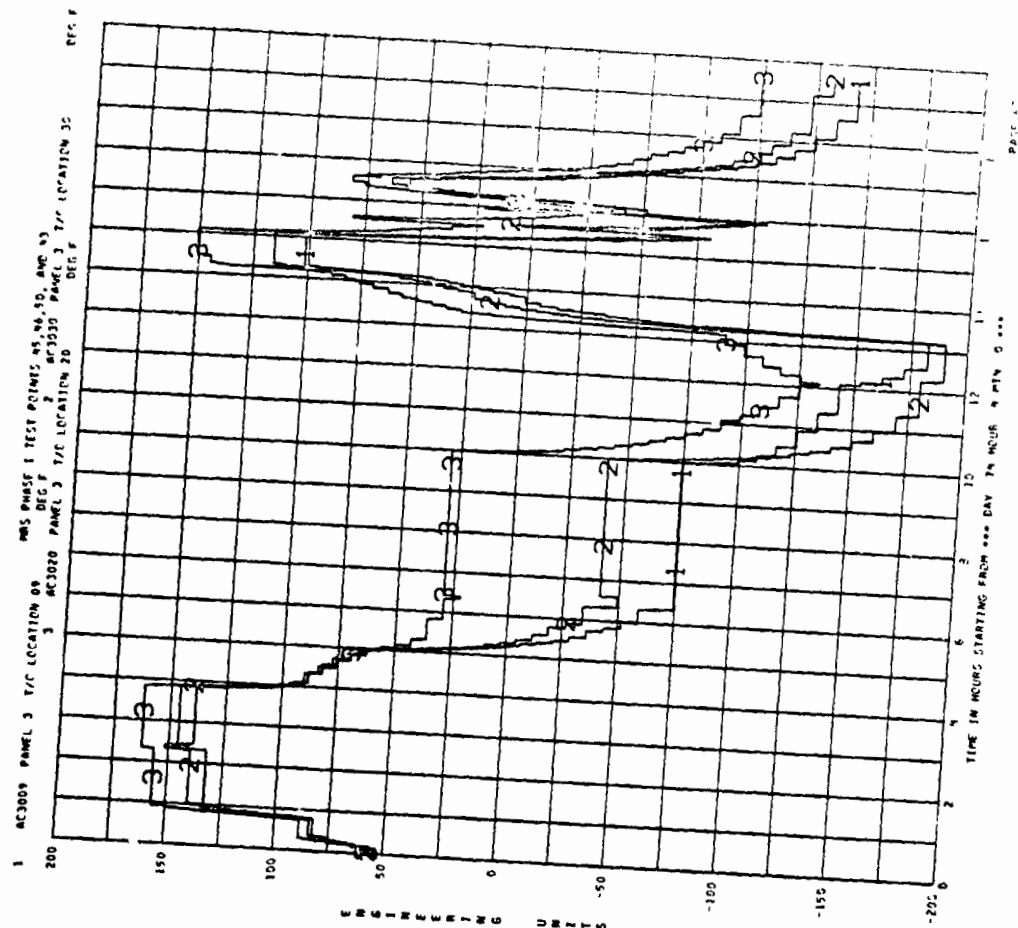
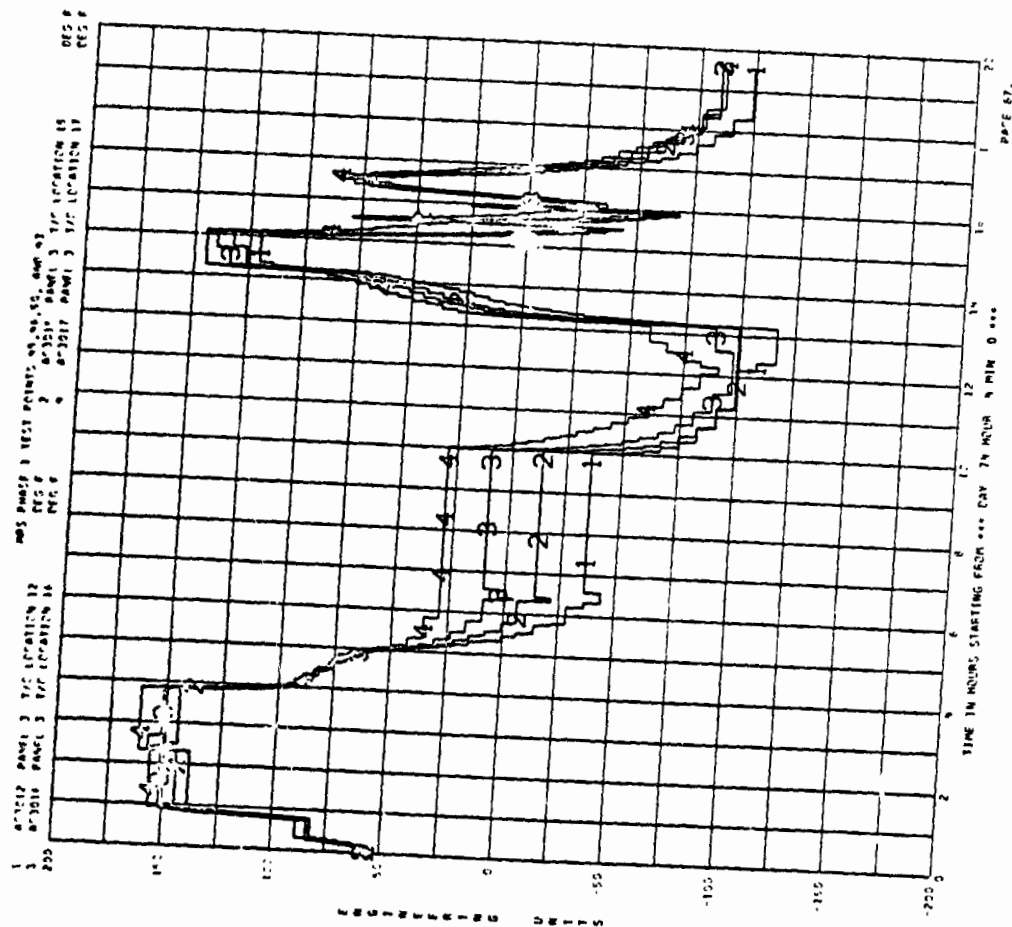


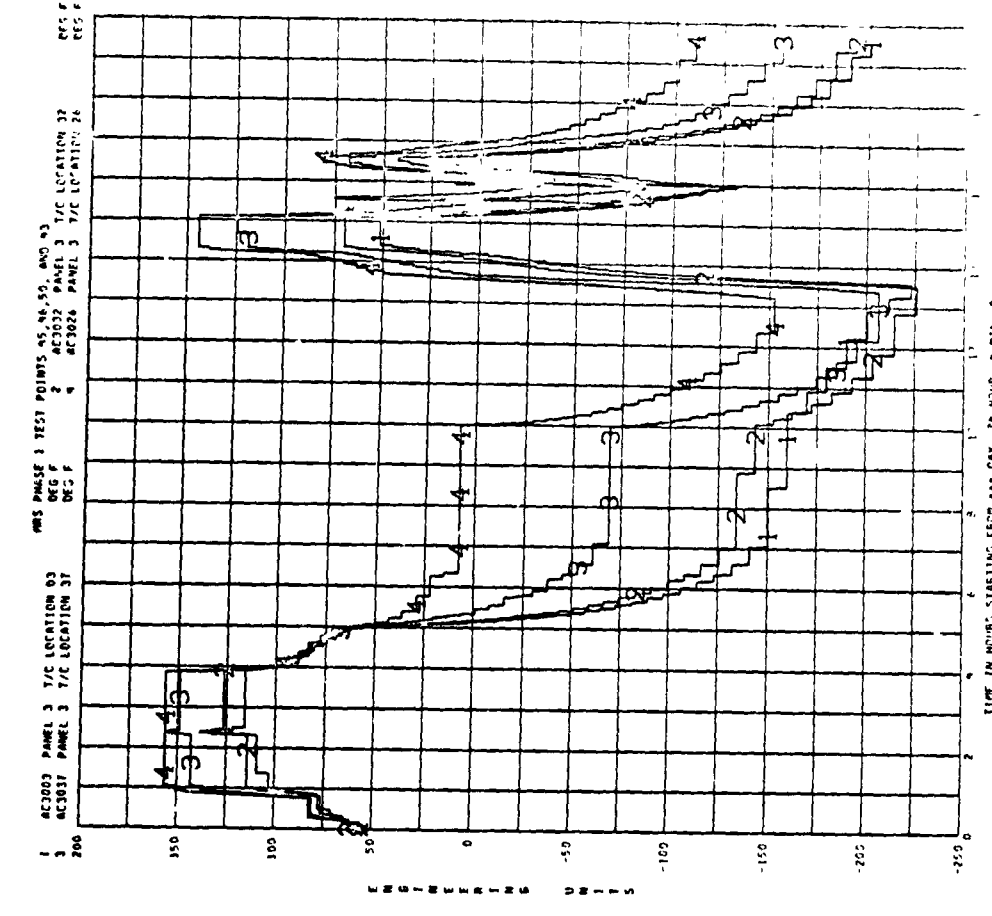
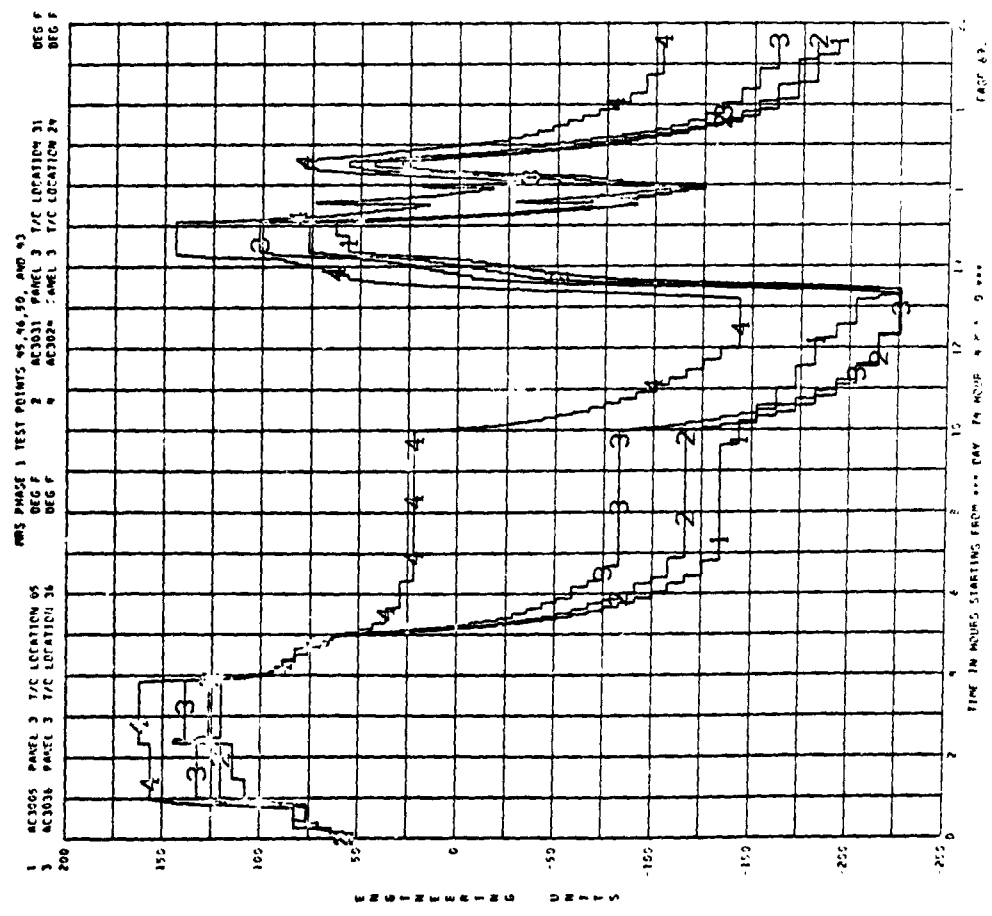


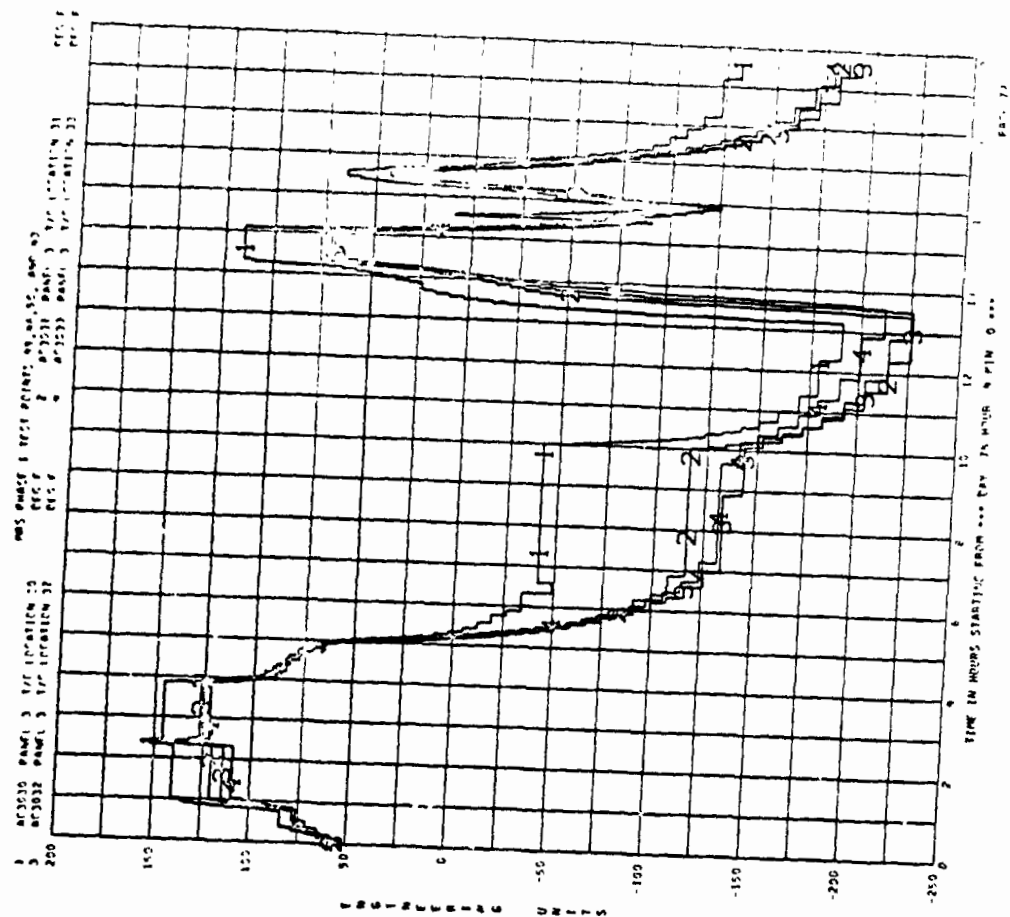
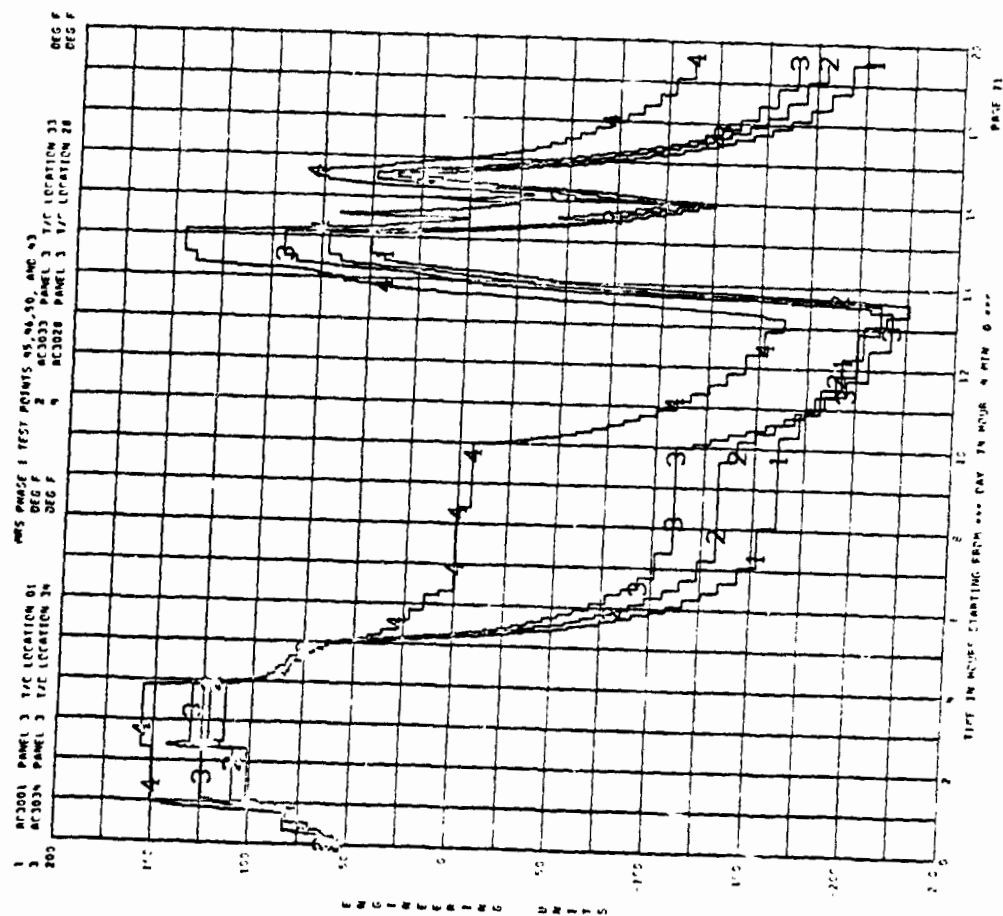


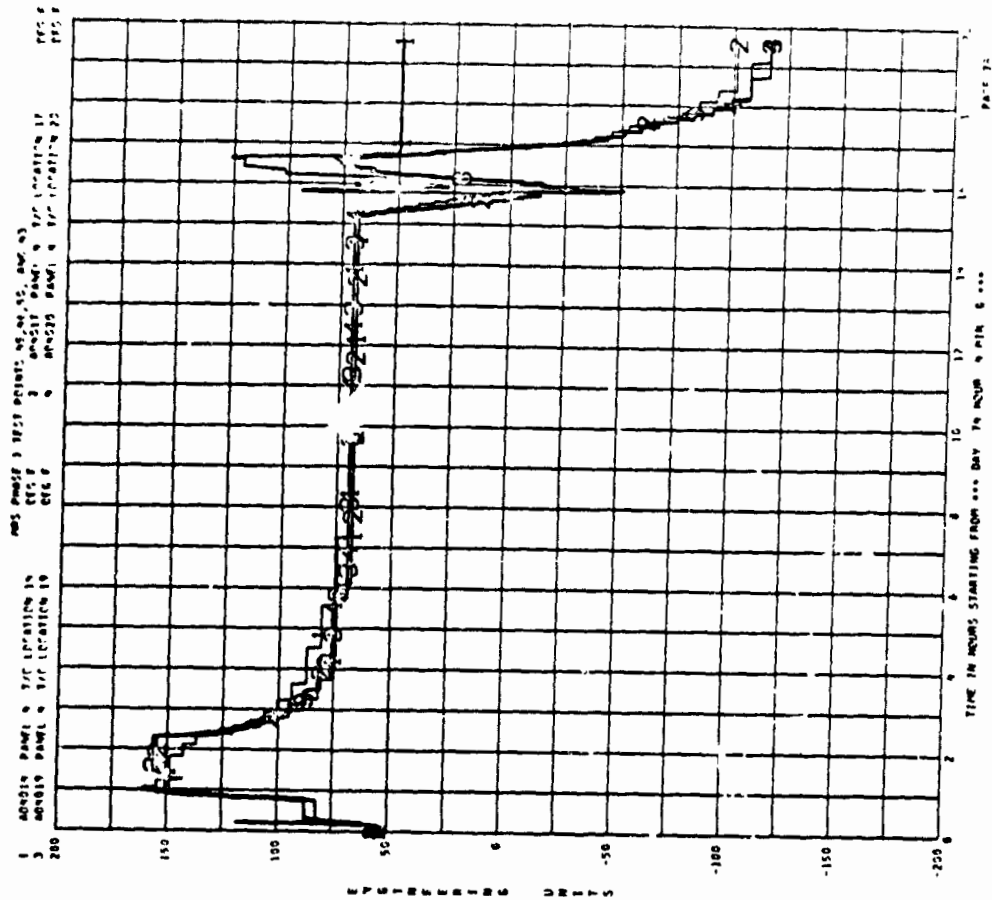
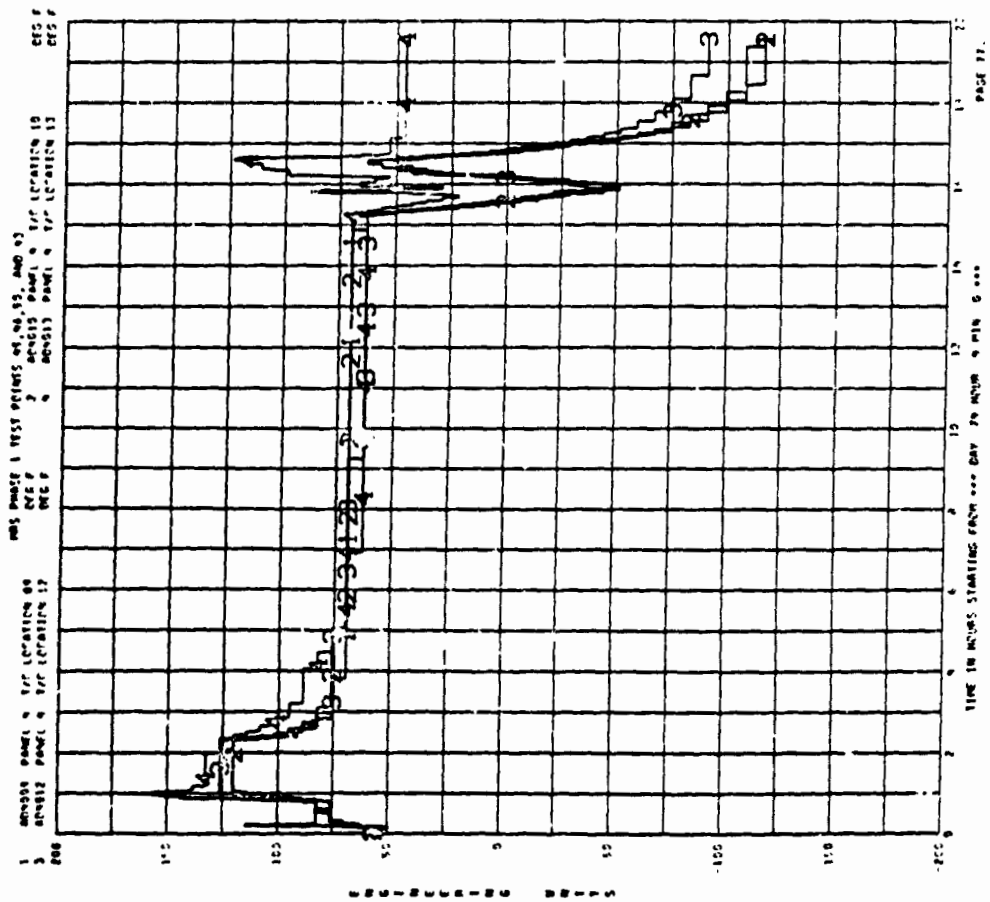


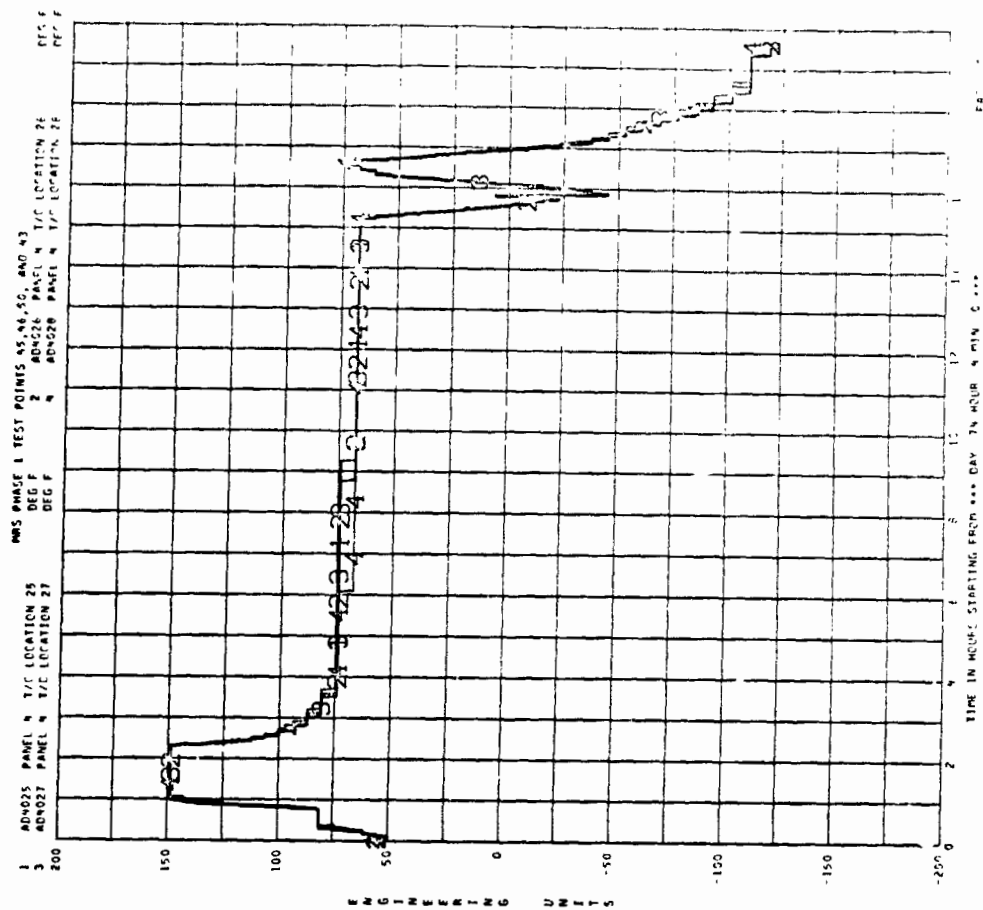
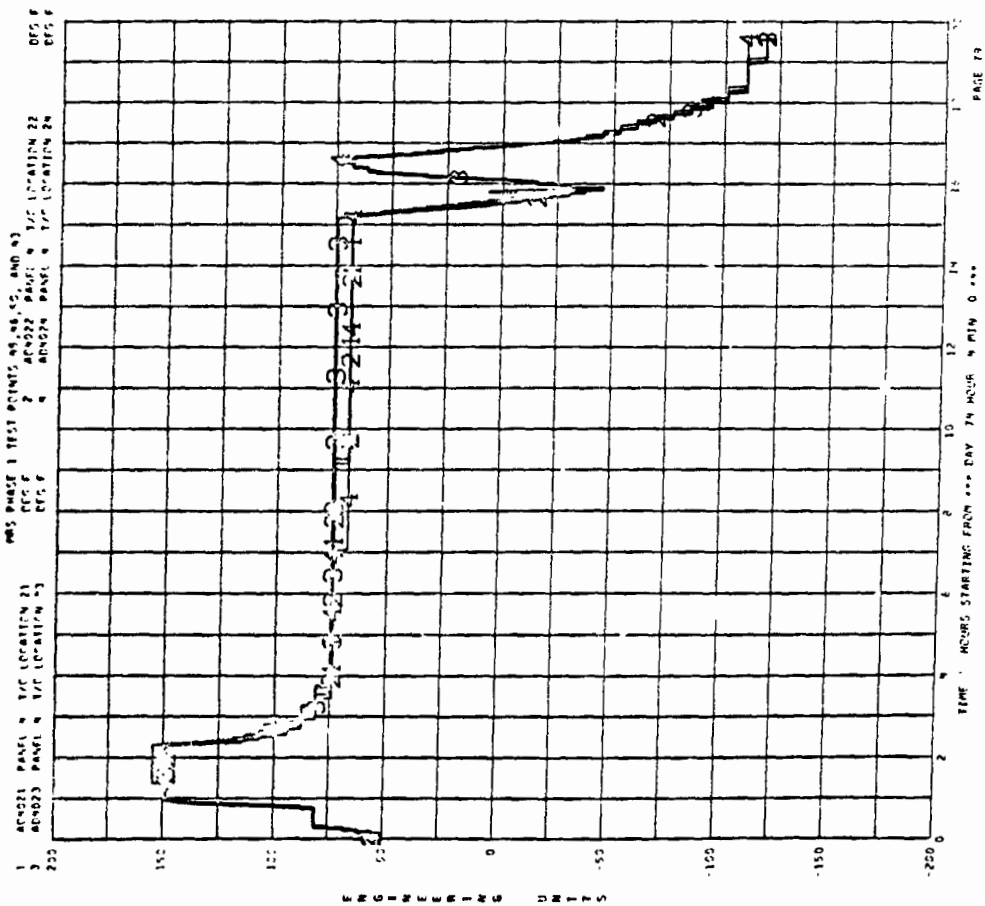


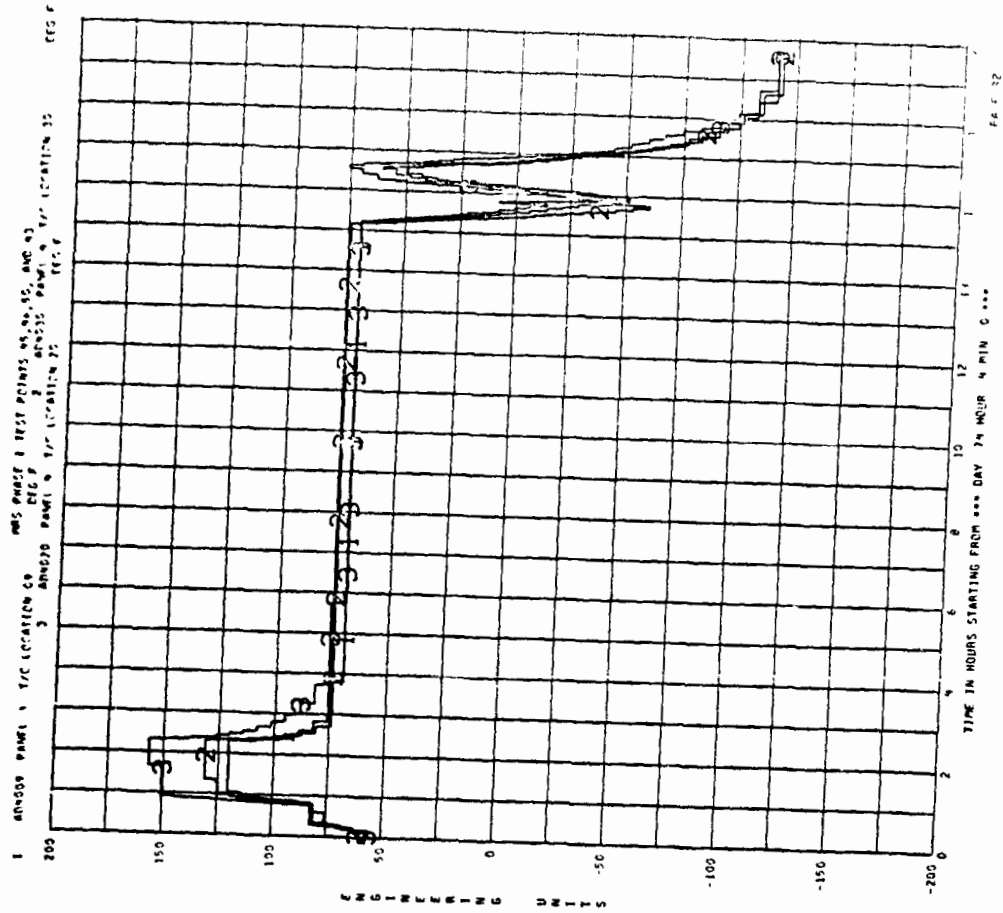
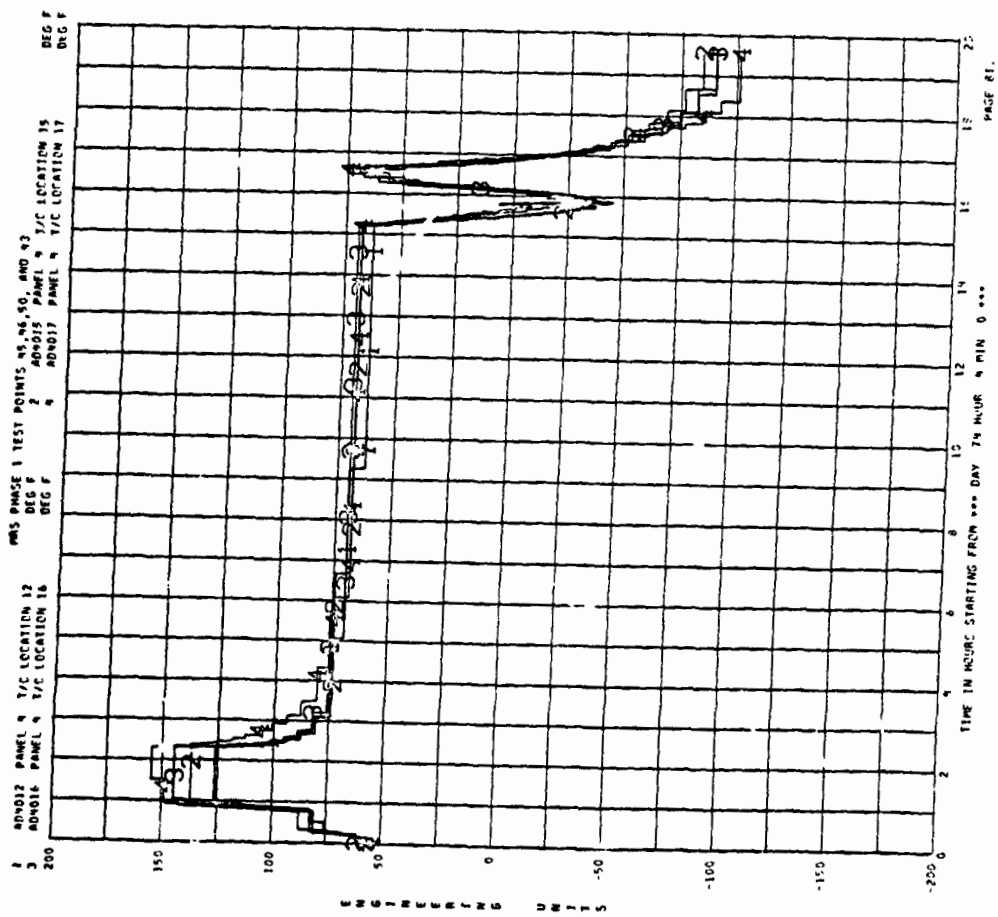


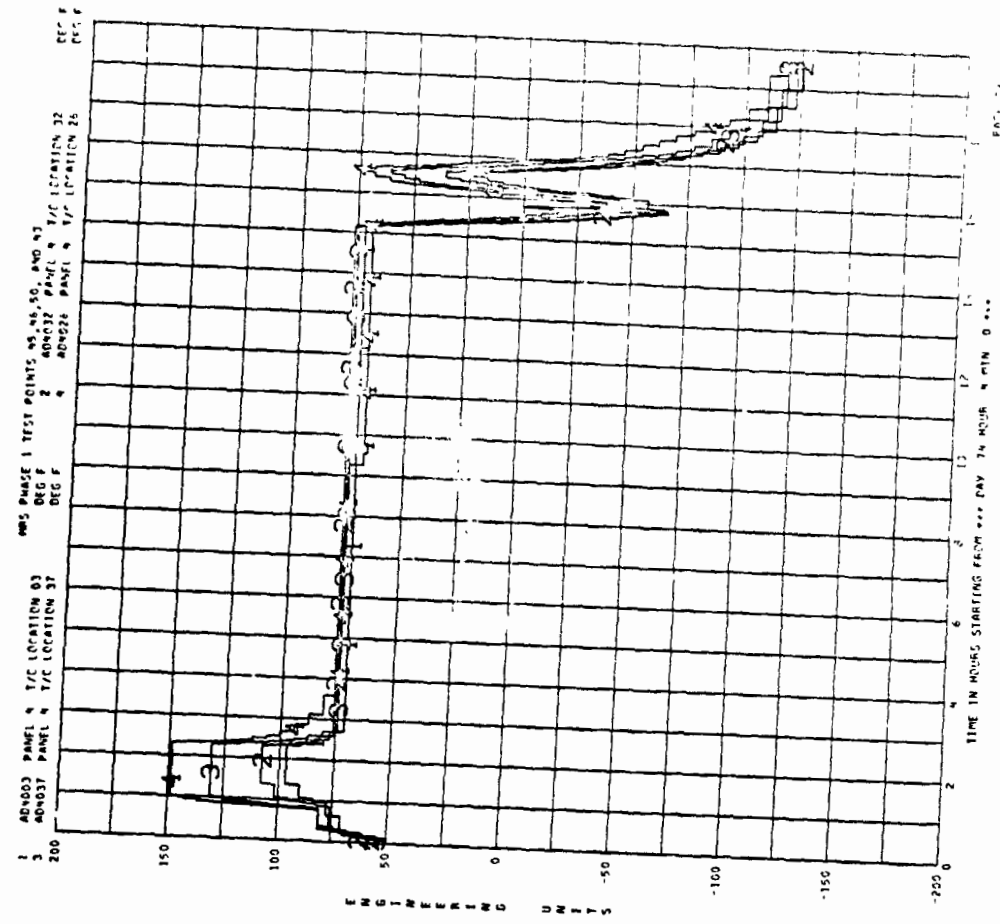
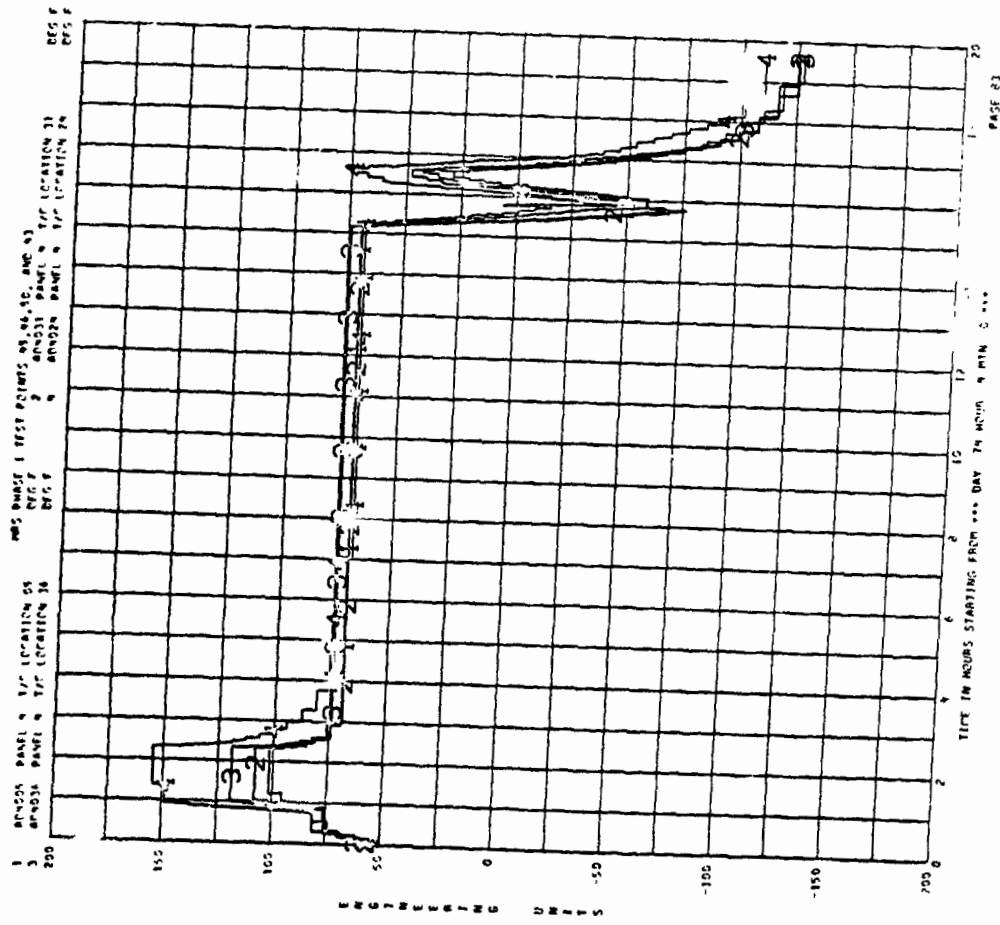


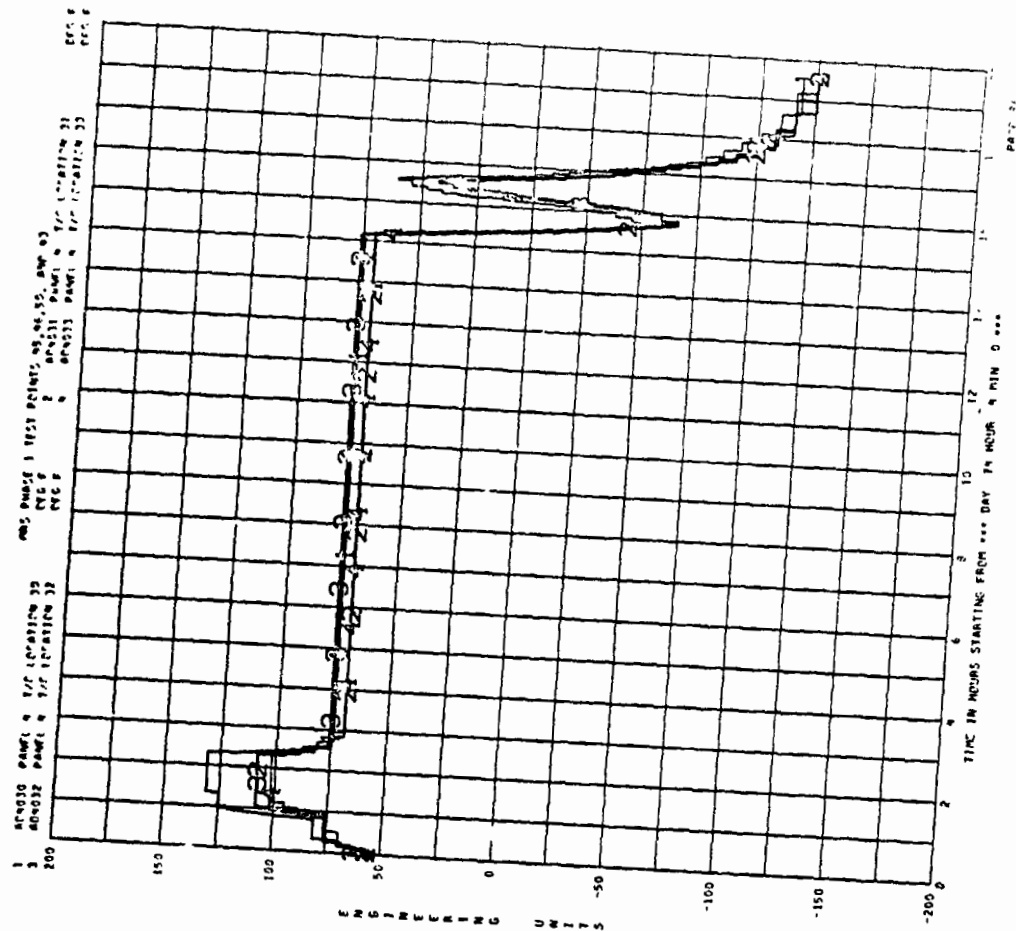
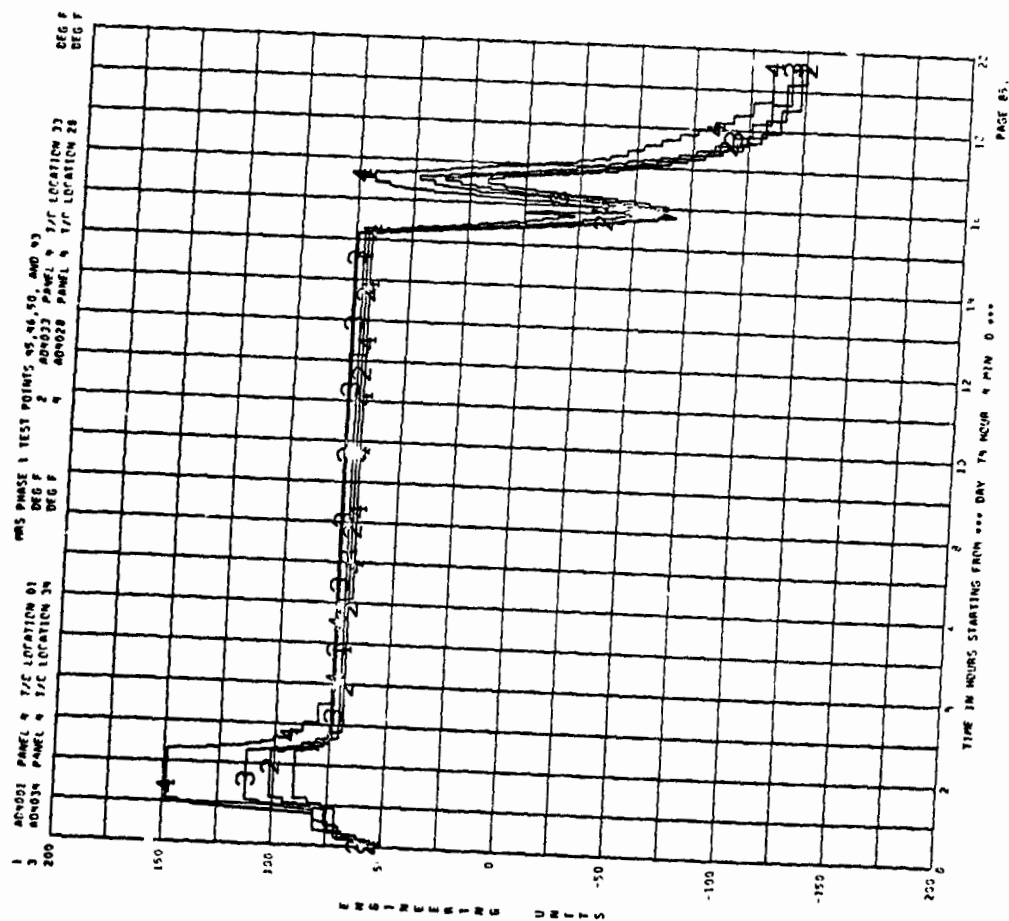












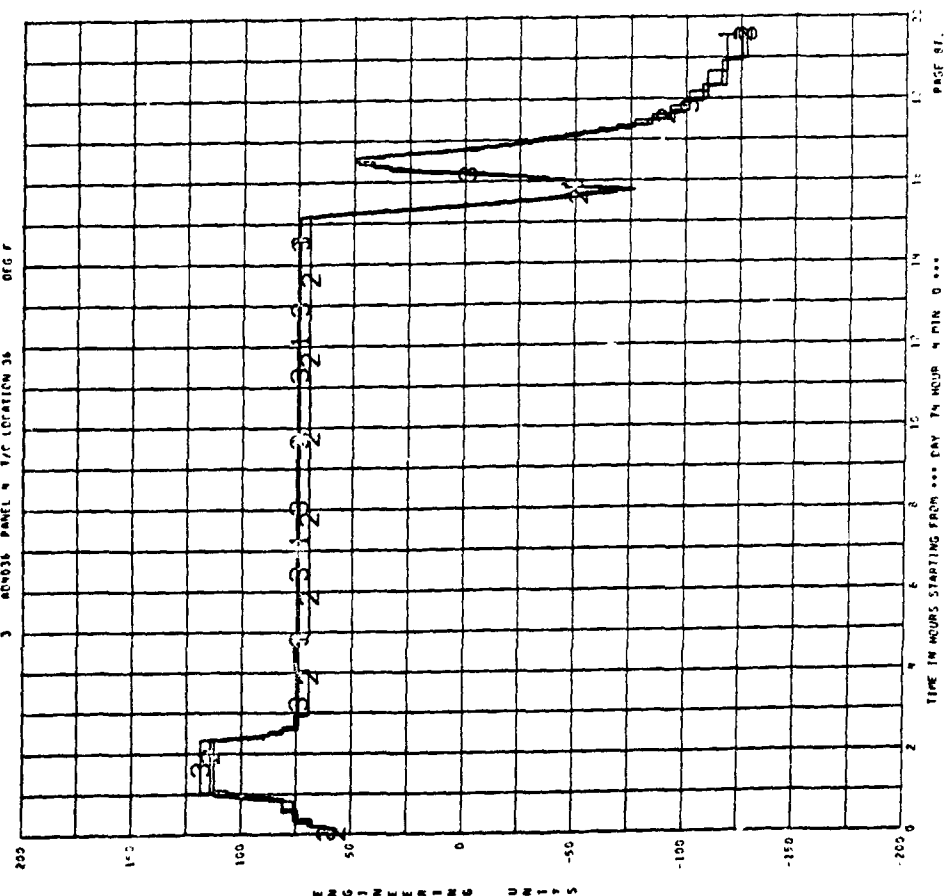
1 AD0034 PANEL 4 T/C LOCATION 34
 2 AD0035 PANEL 4 T/C LOCATION 35
 3 AD0036 PANEL 4 T/C LOCATION 36

PHASE 1 TEST POINTS 45, 46, 50, AND 53

DEG F

DEG F

DEG F



PAGE 81

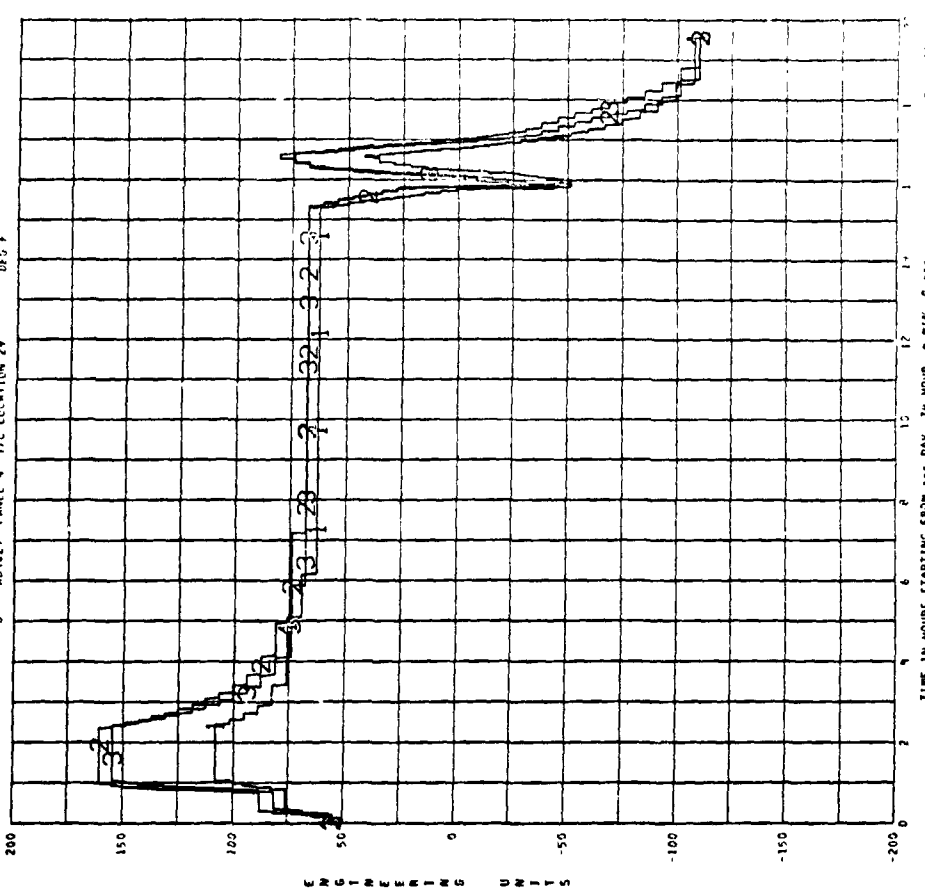
1 AD0011 PANEL 4 T/C LOCATION 11
 2 AD0012 PANEL 4 T/C LOCATION 12
 3 AD0013 PANEL 4 T/C LOCATION 13

PHASE 1 TEST POINTS 45, 46, 50, AND 53

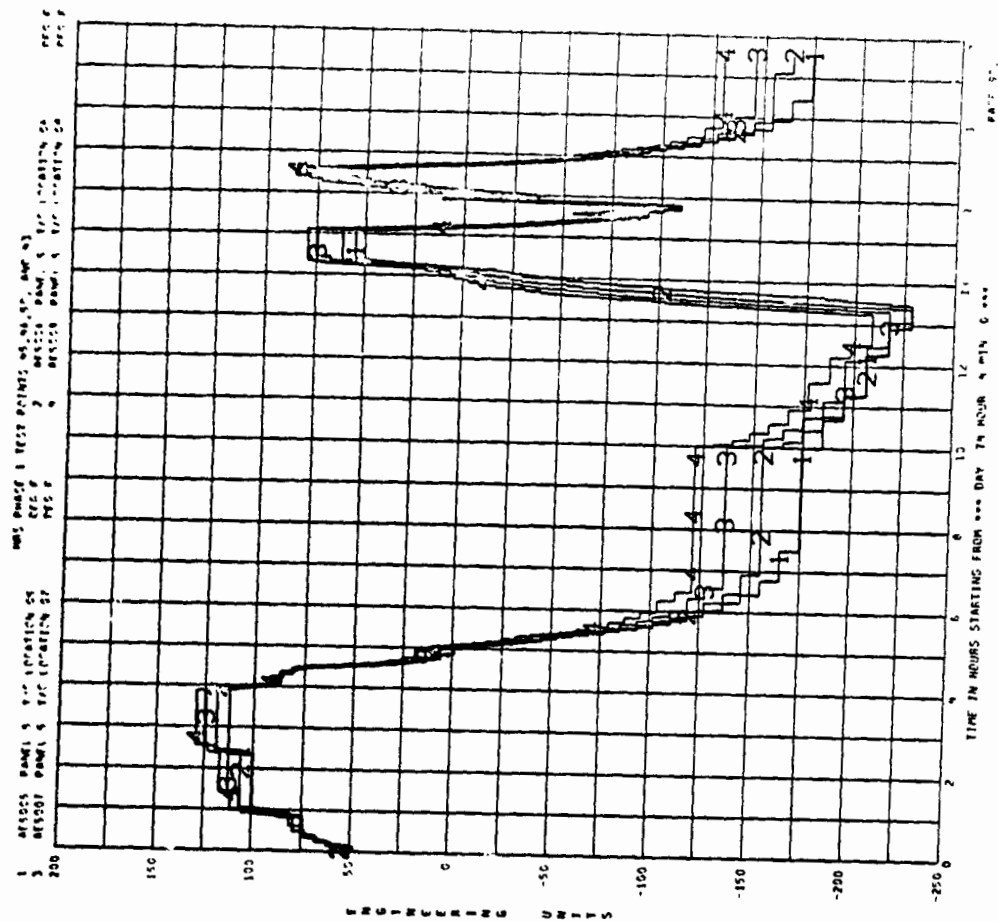
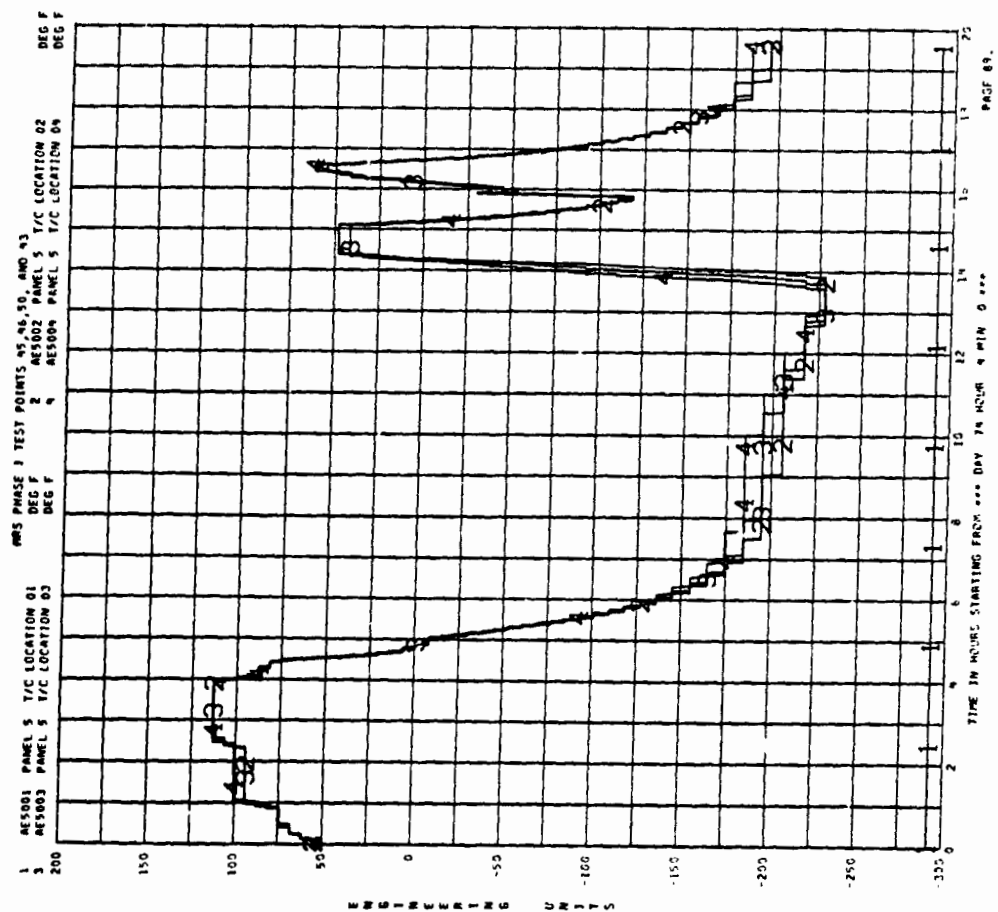
DEG F

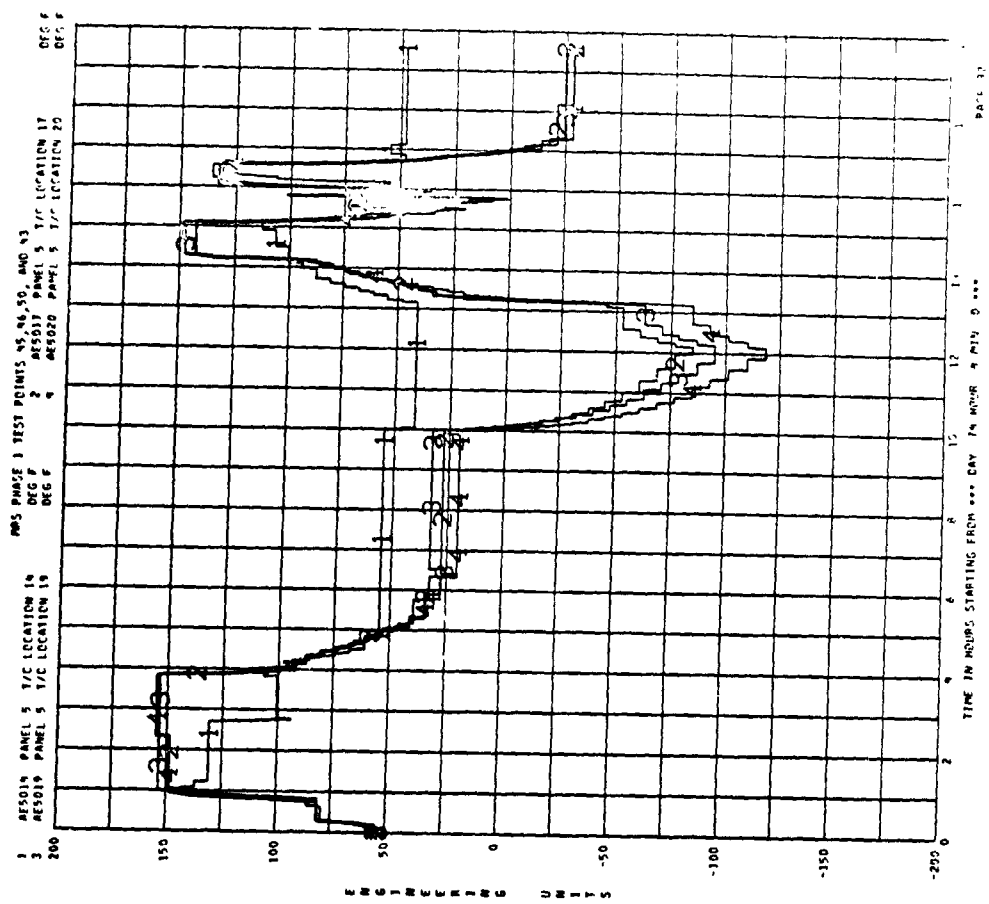
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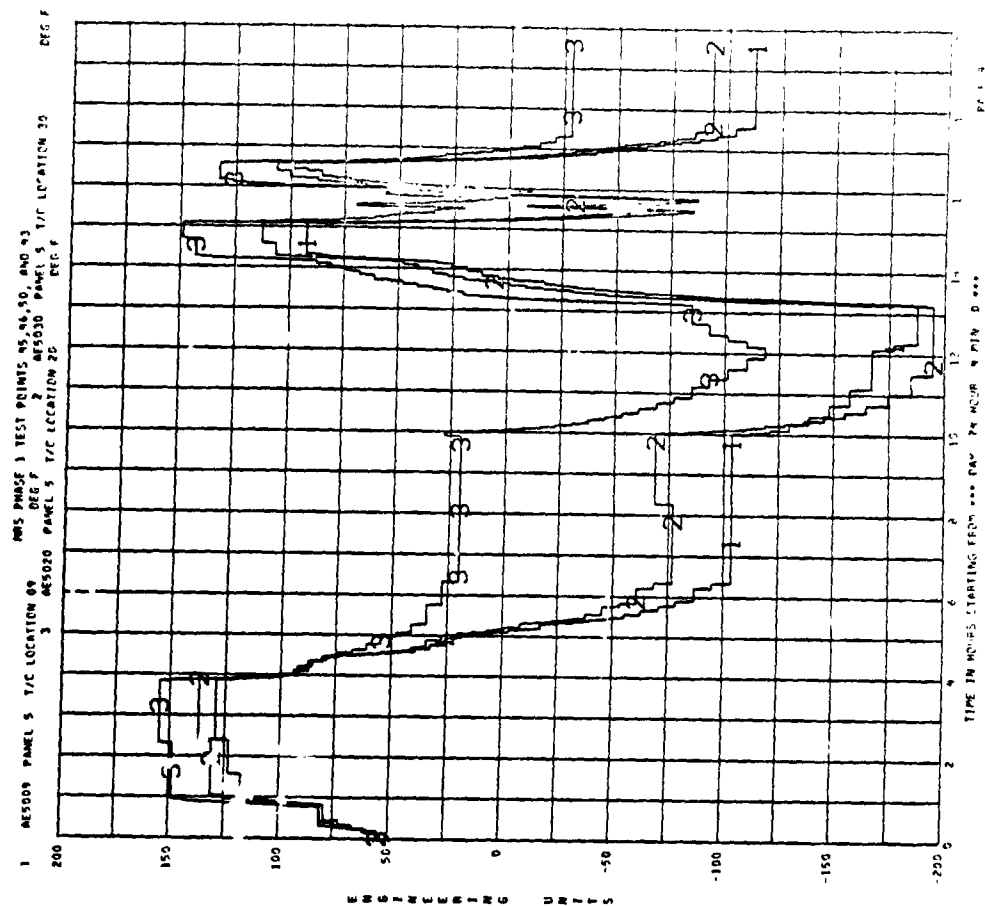
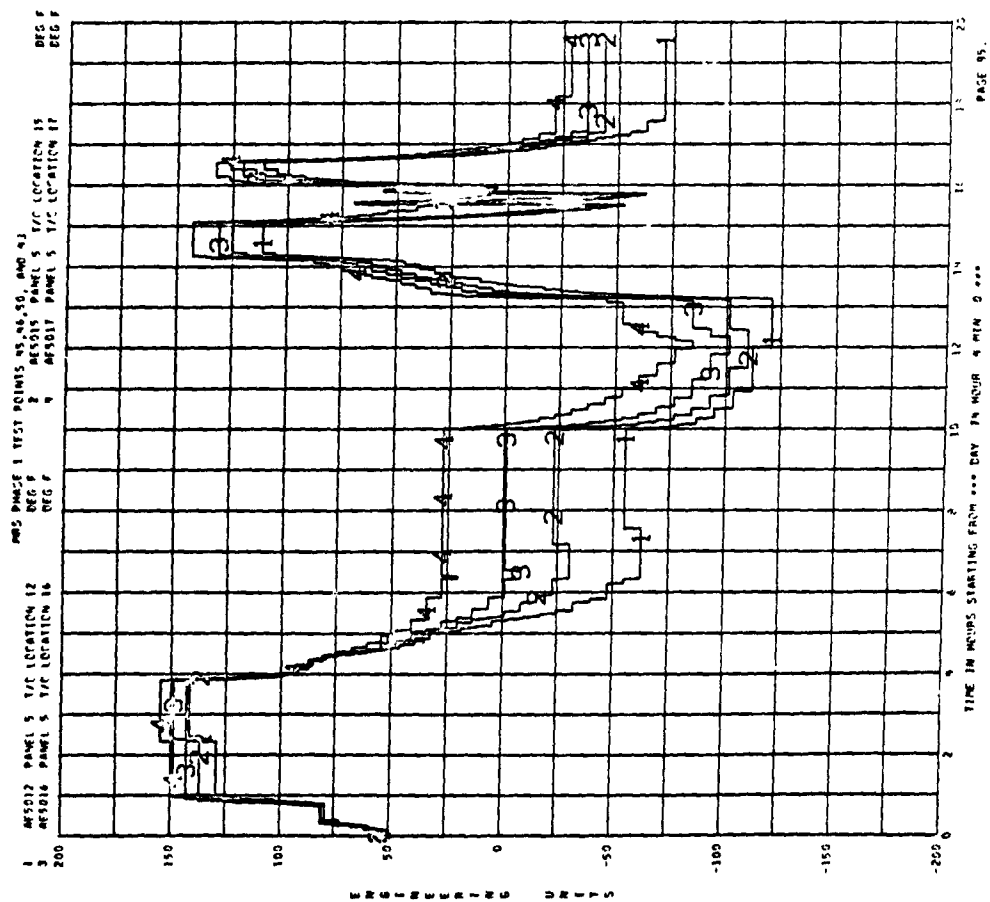
DEG F

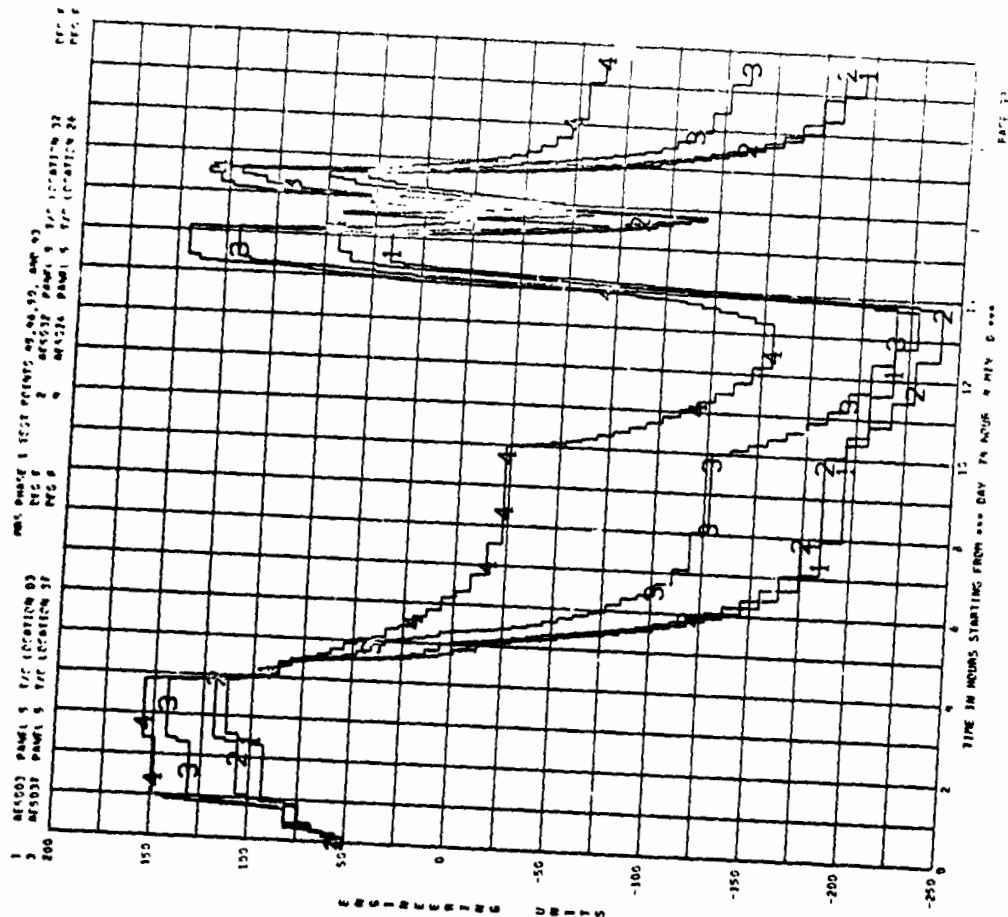
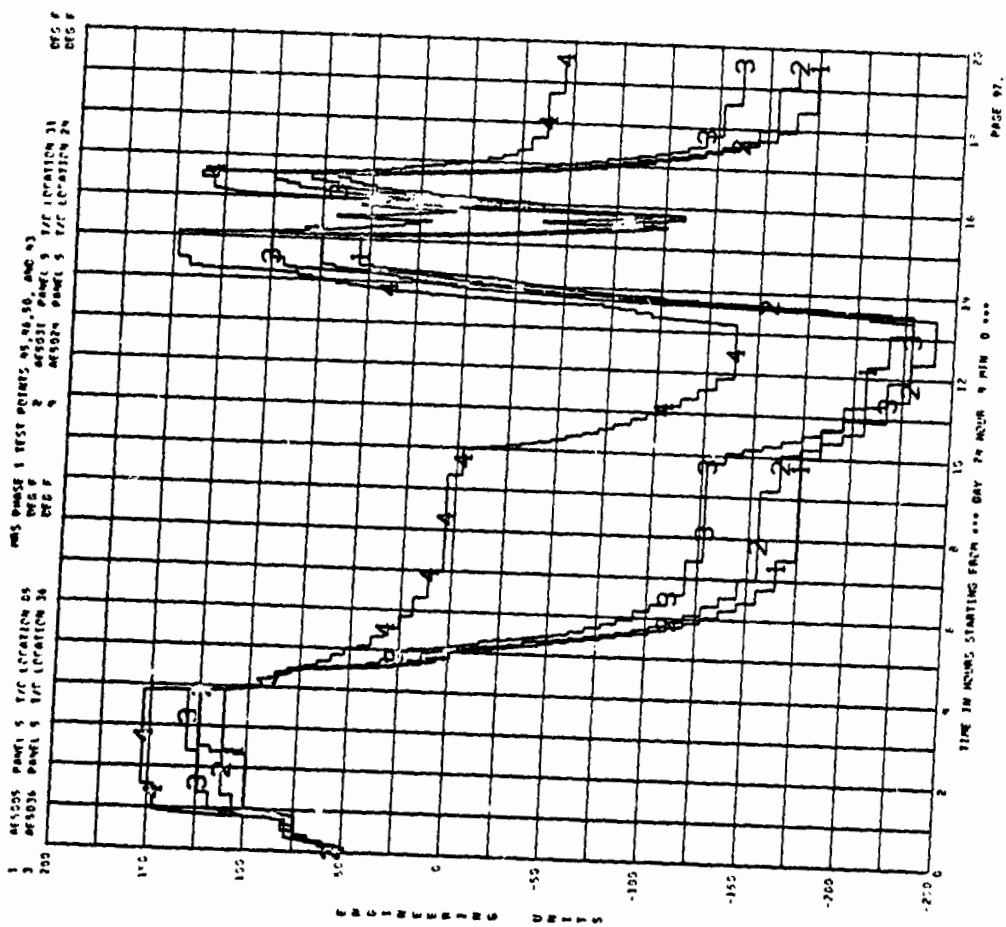


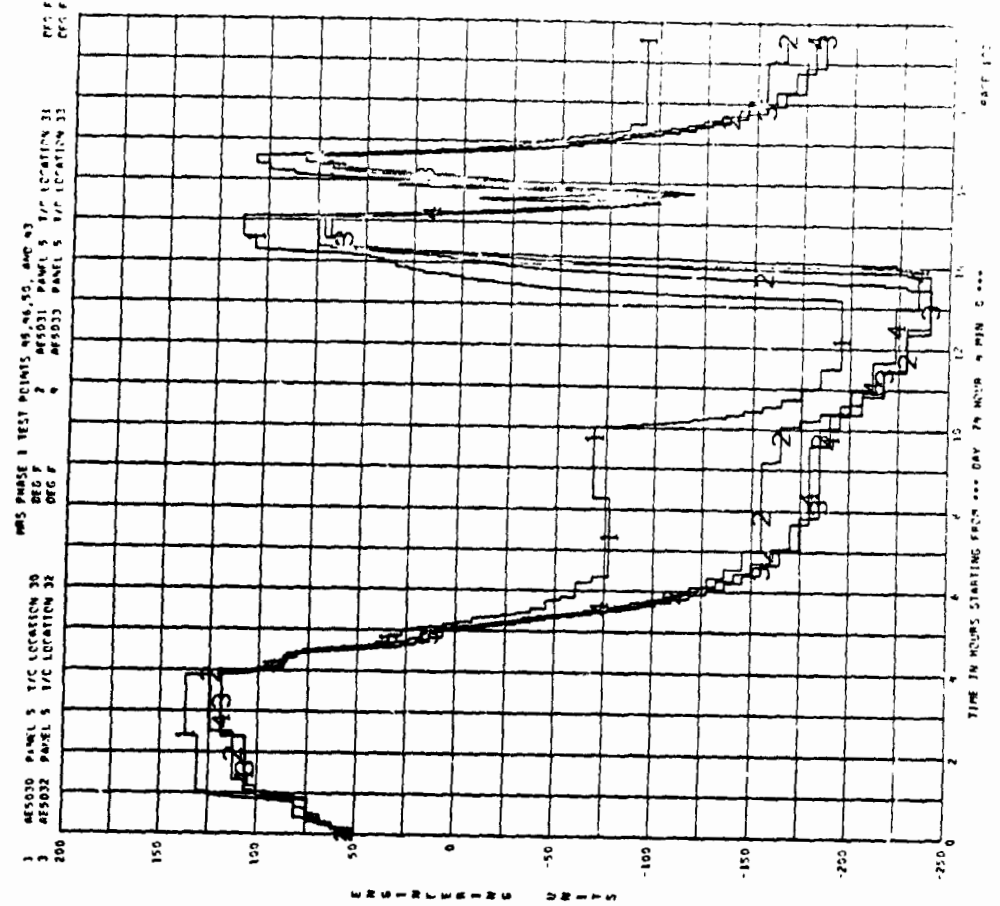
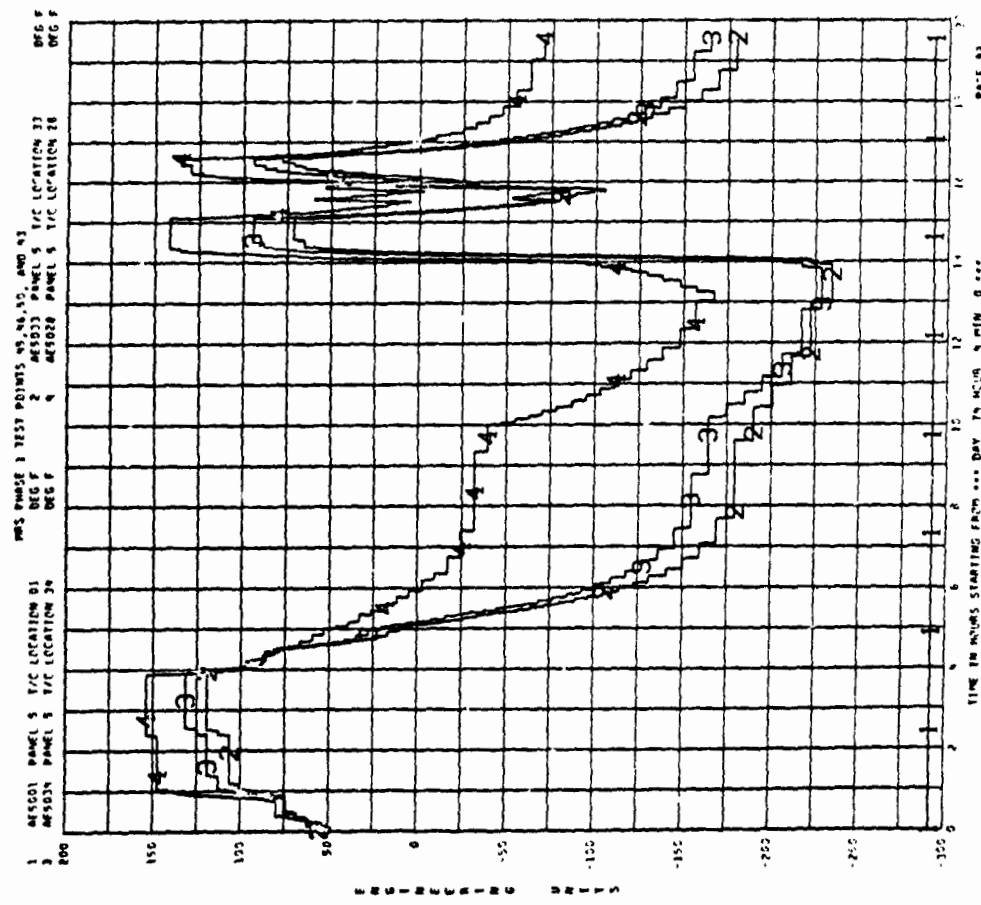
PAGE 82

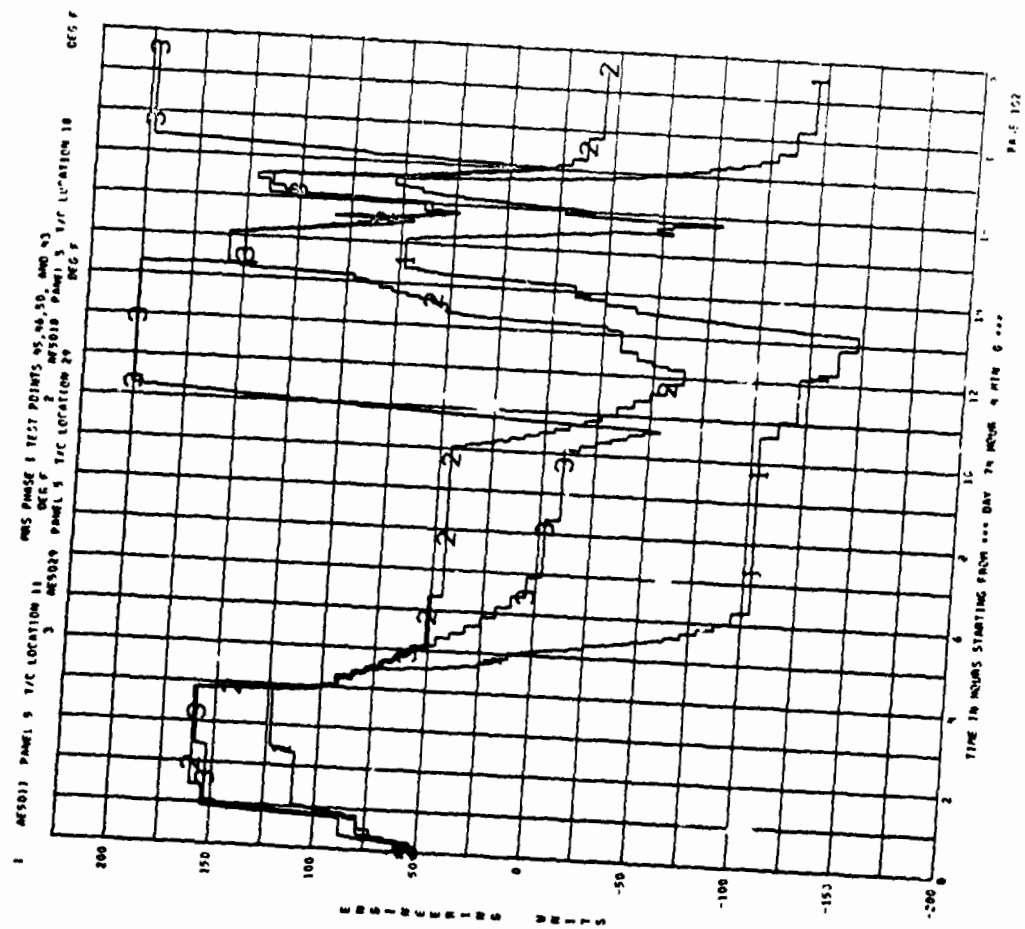
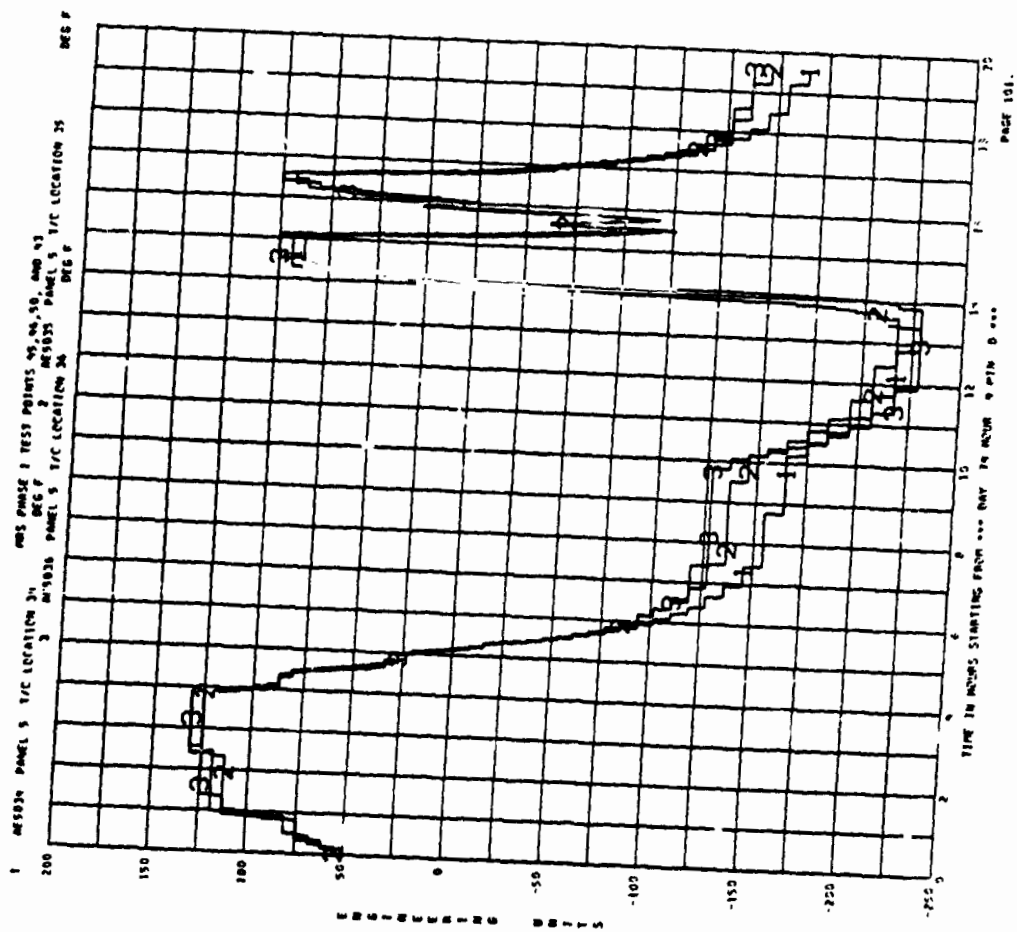


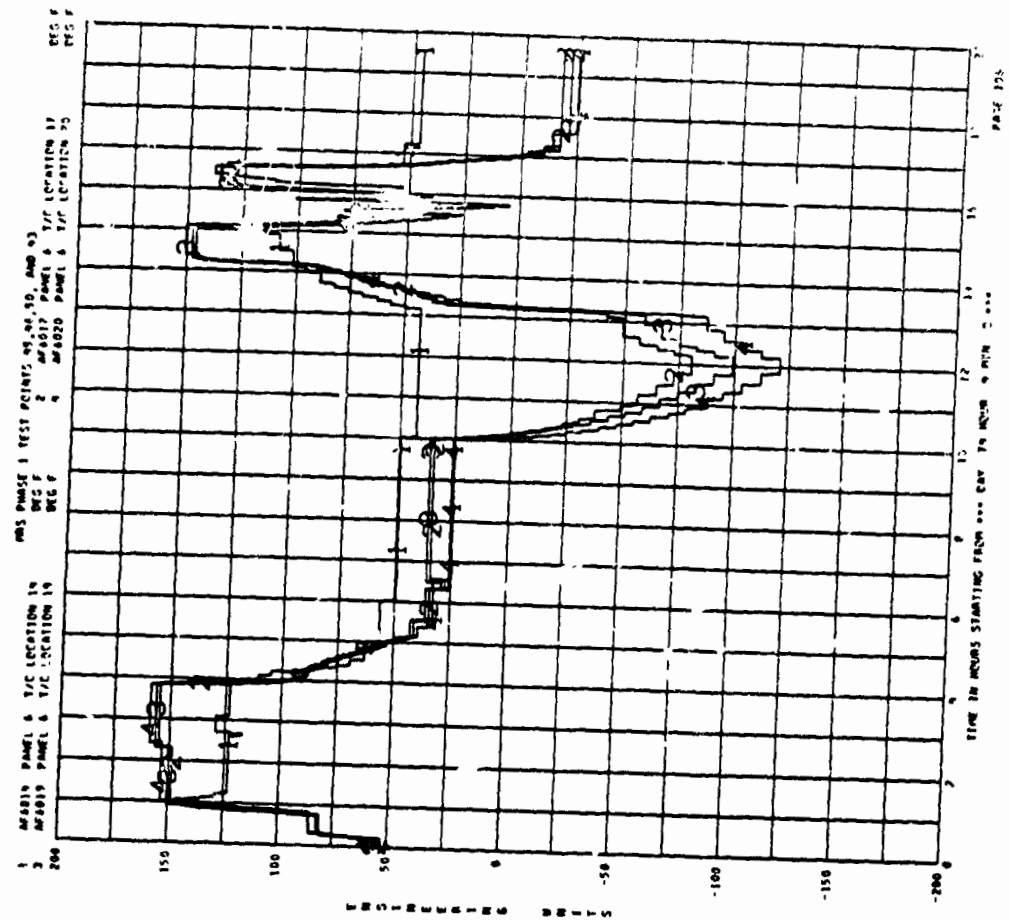
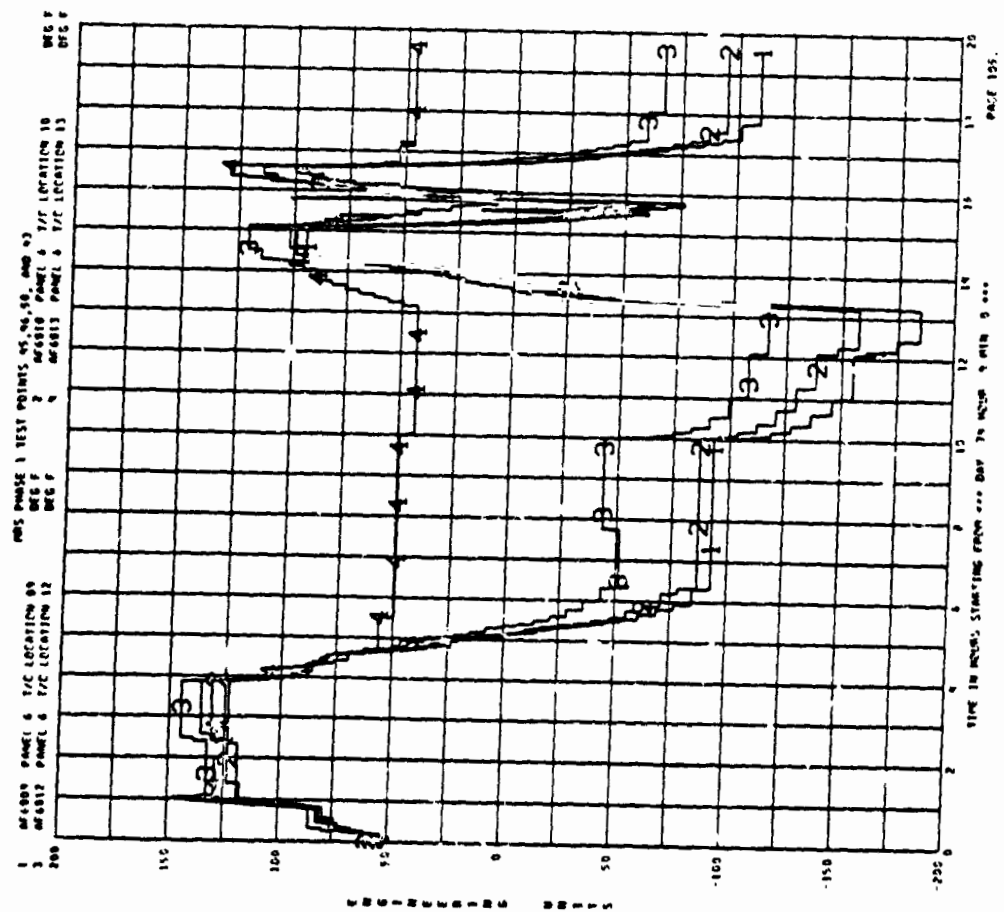


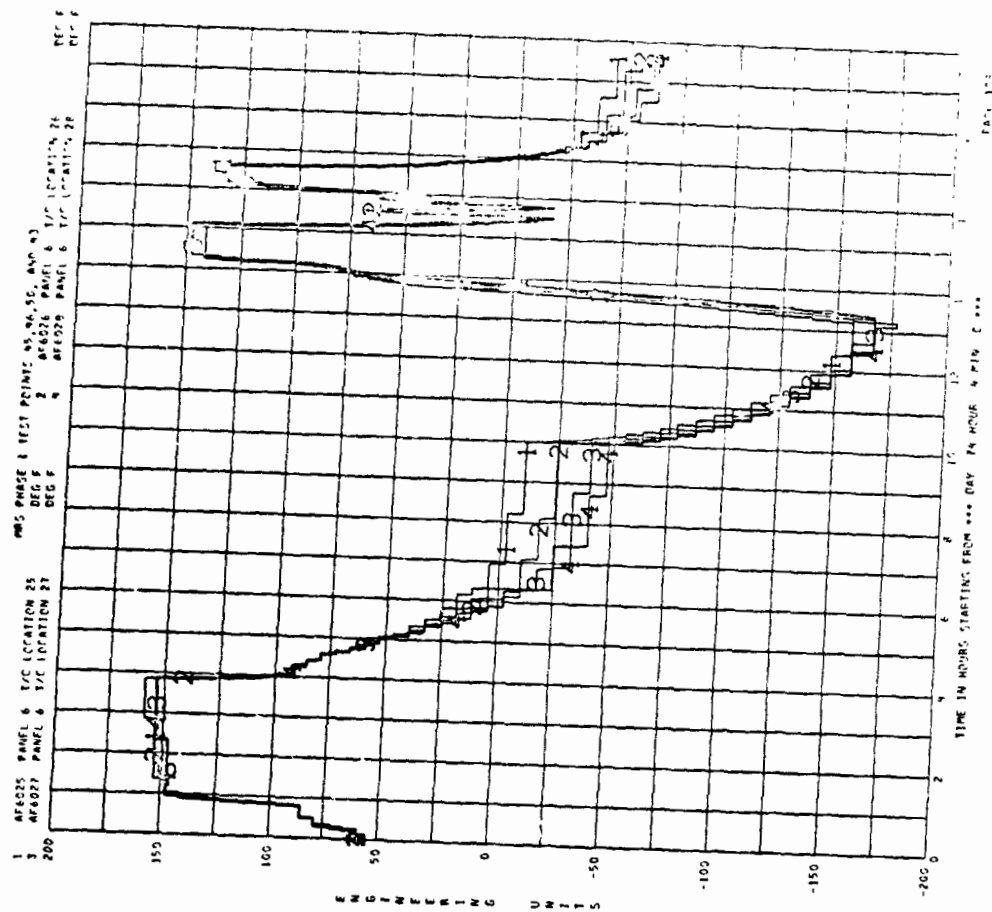
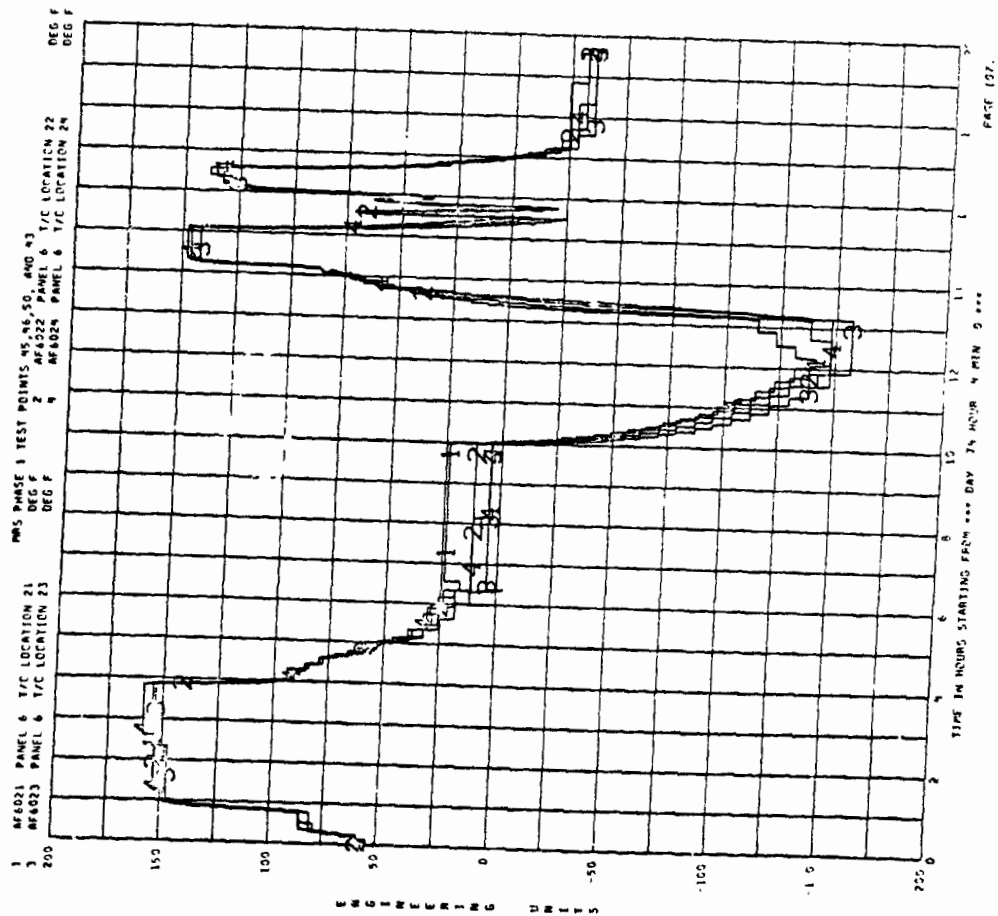


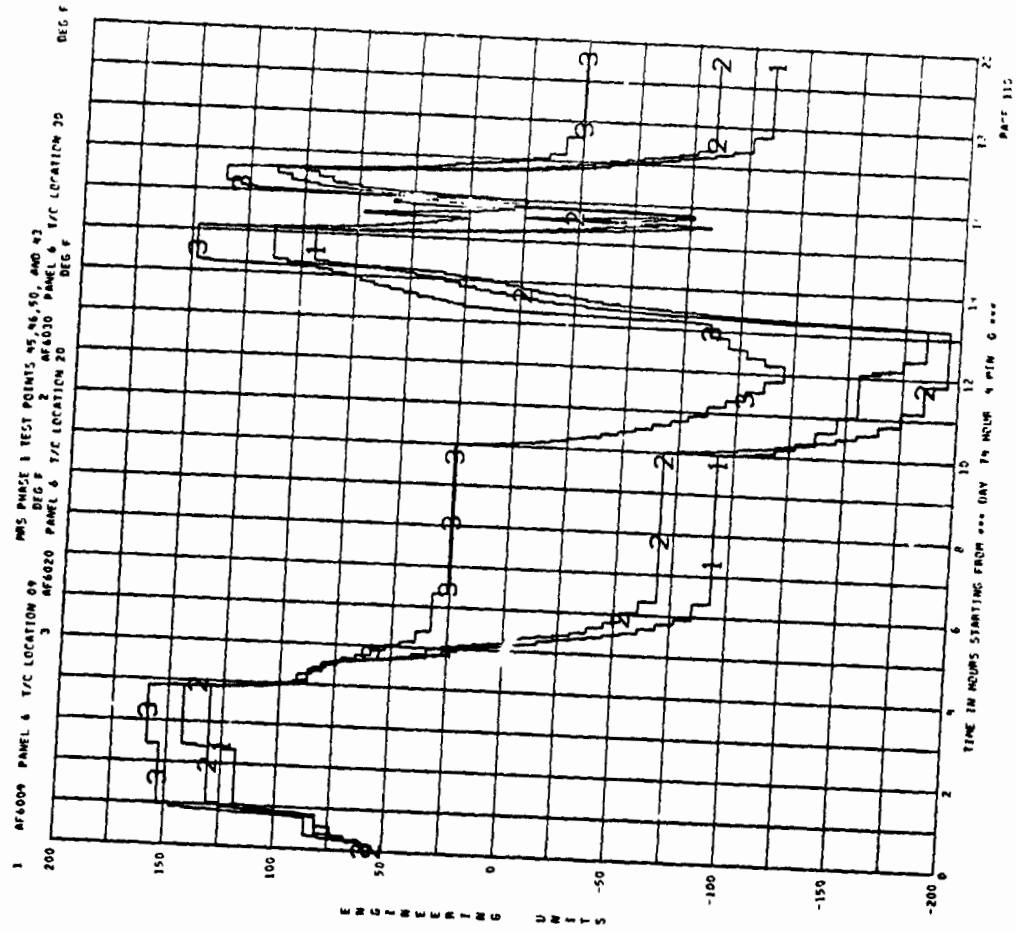
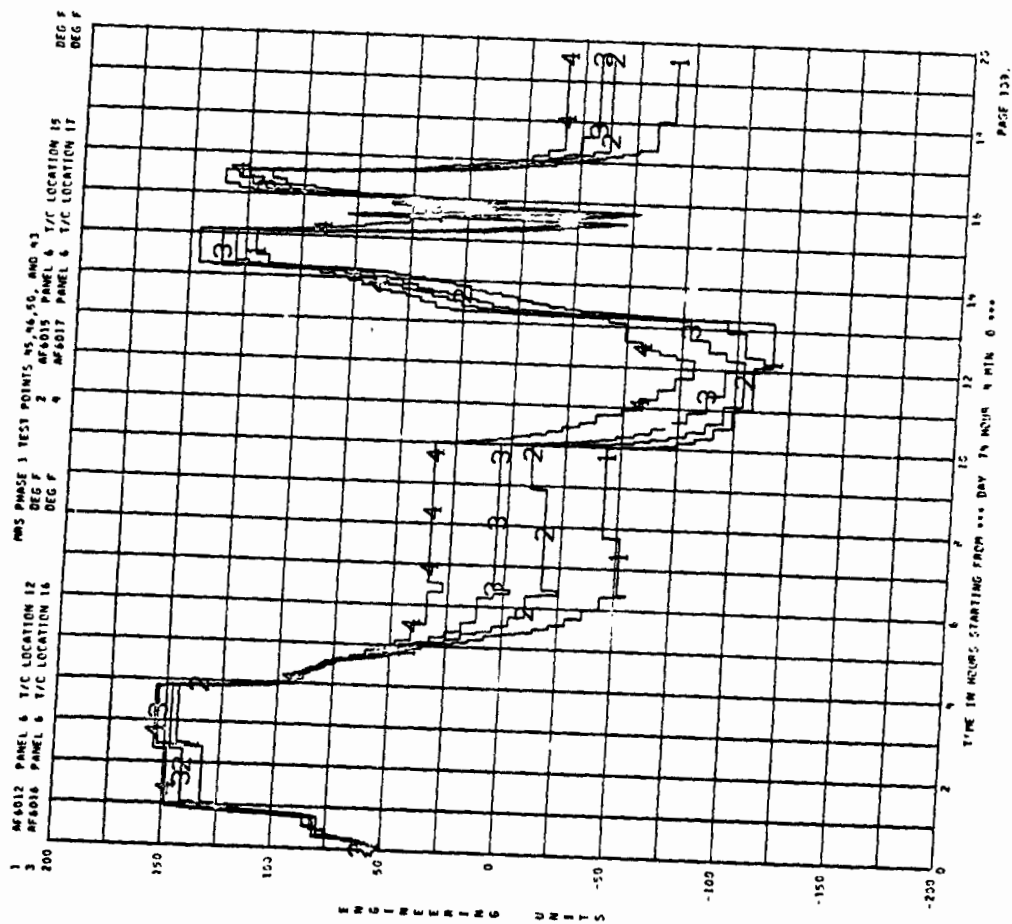


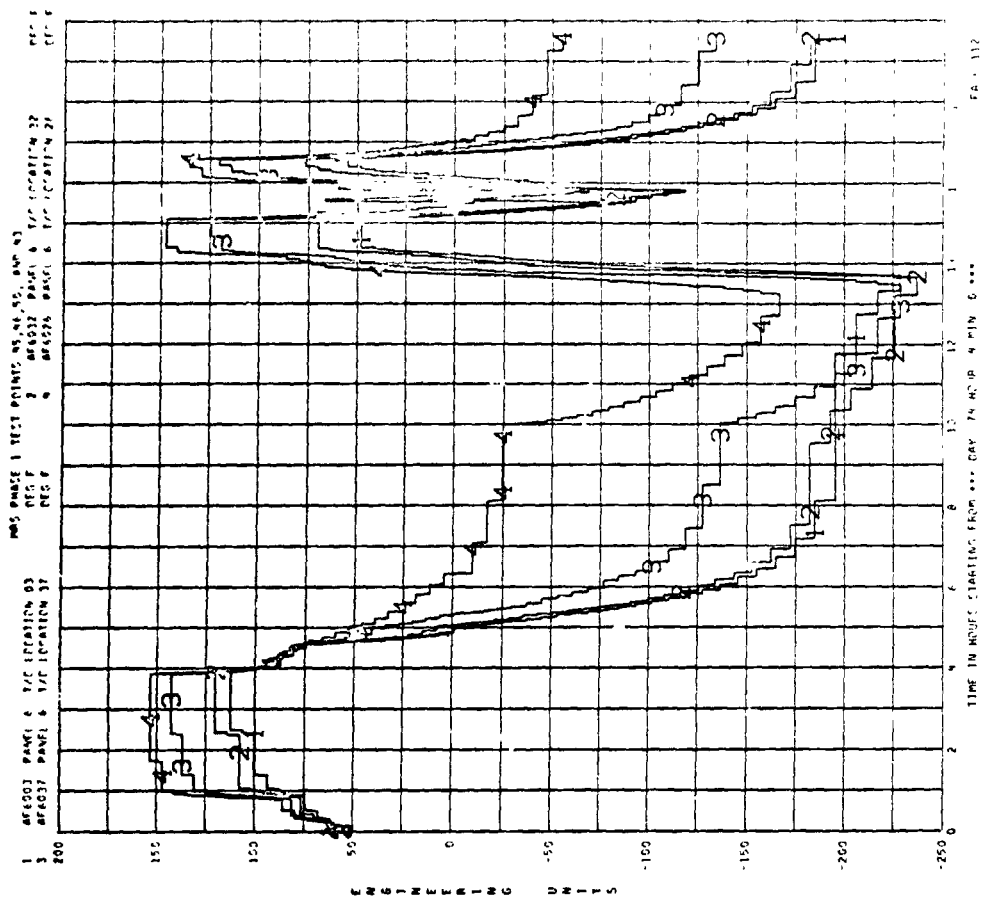
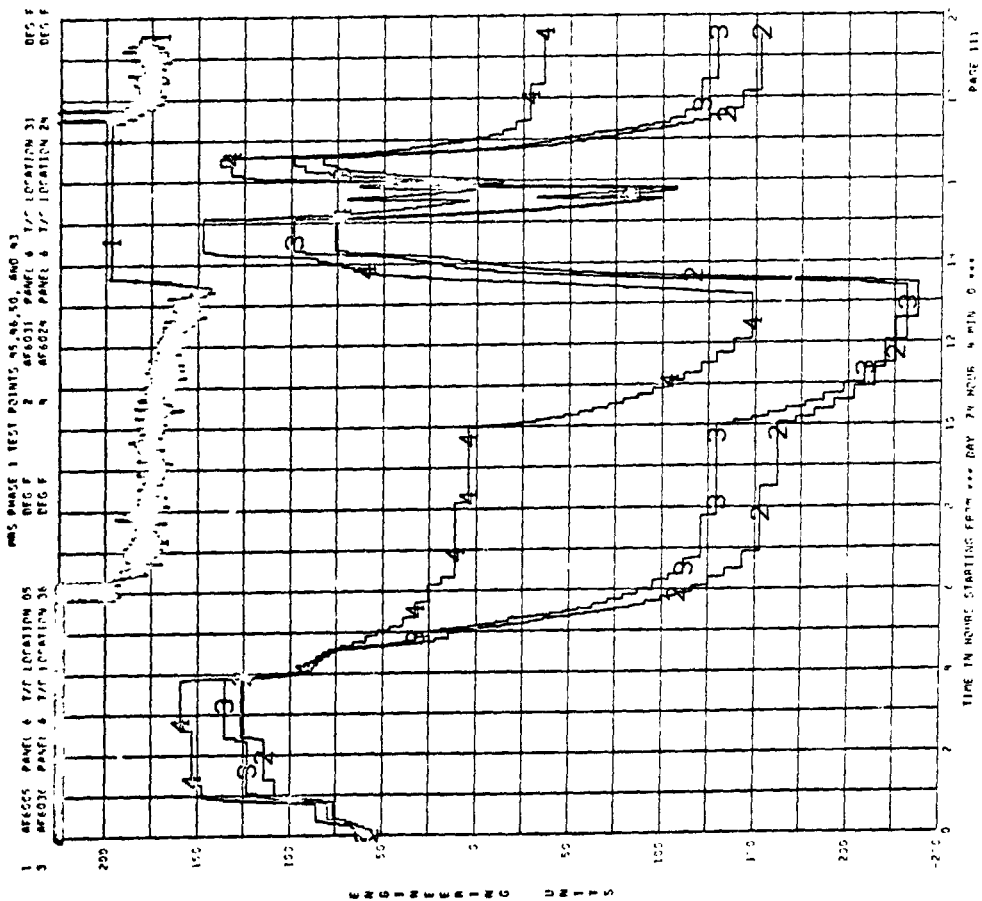




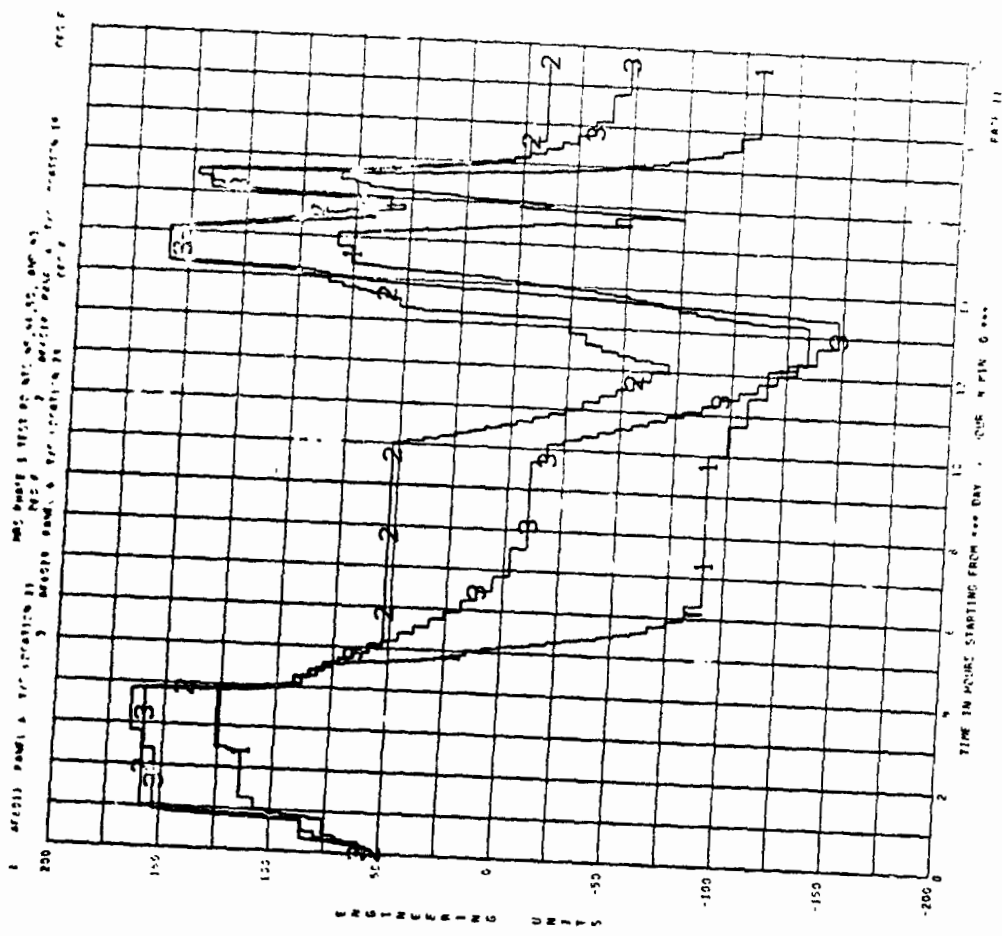
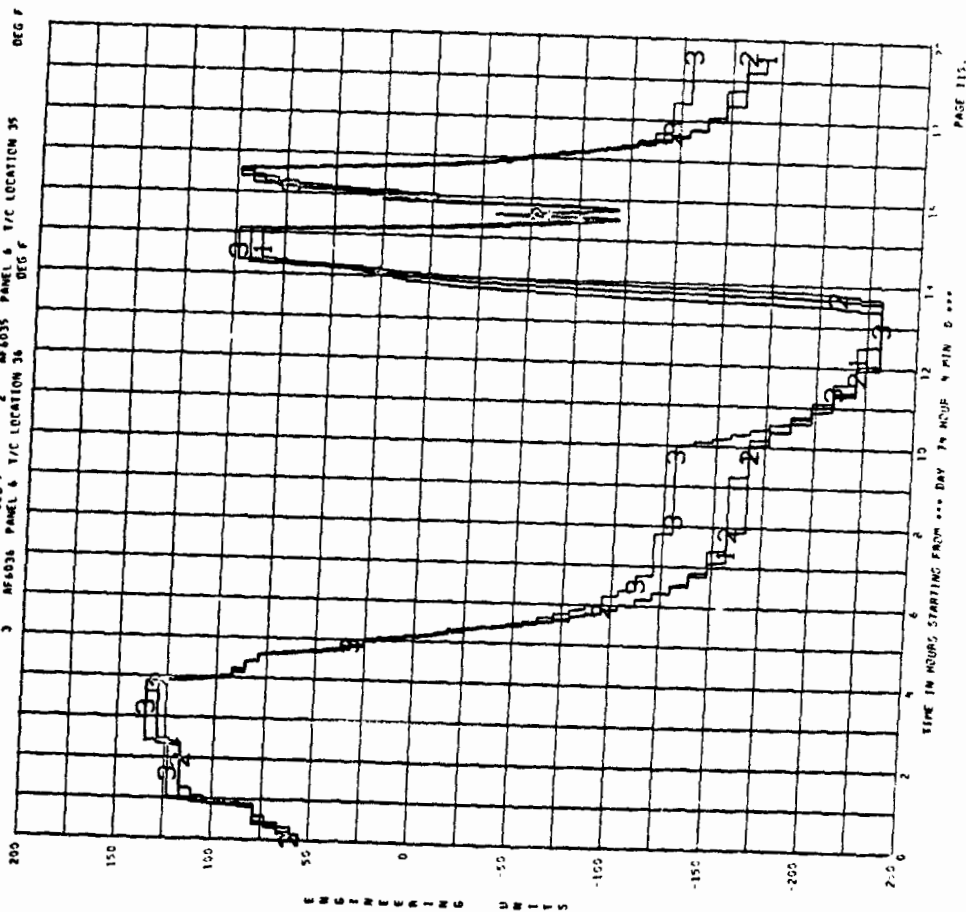


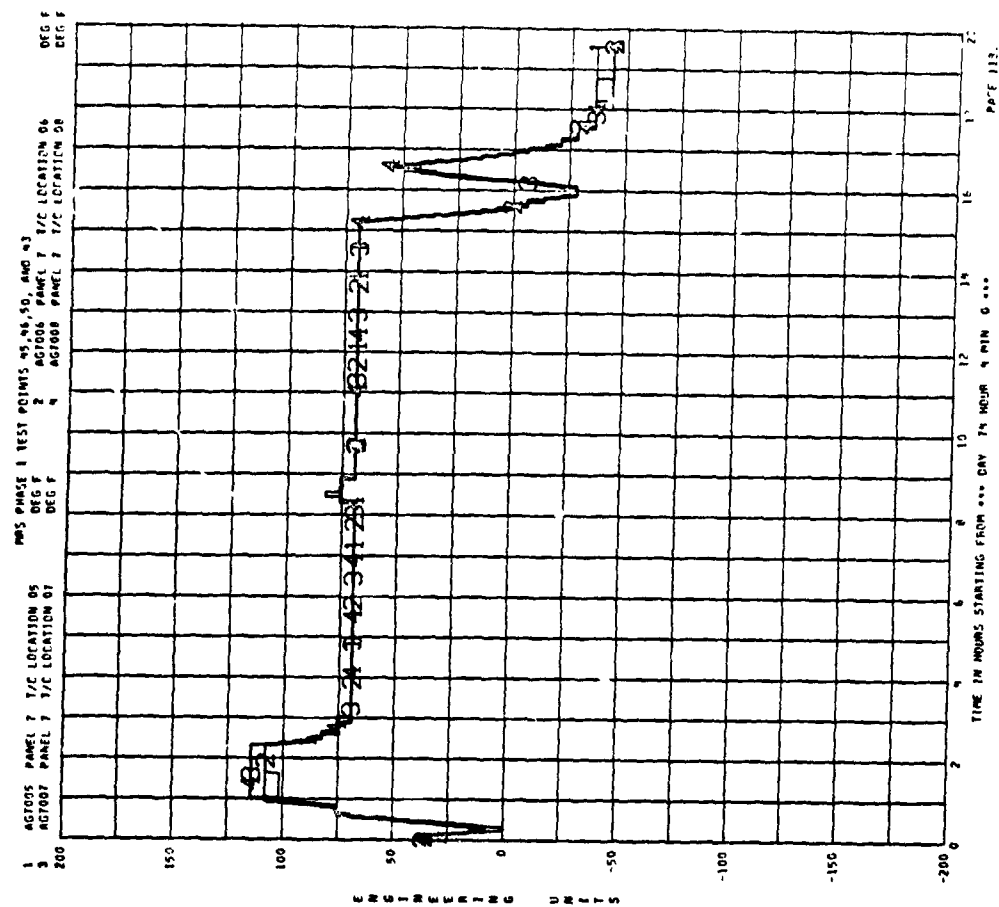


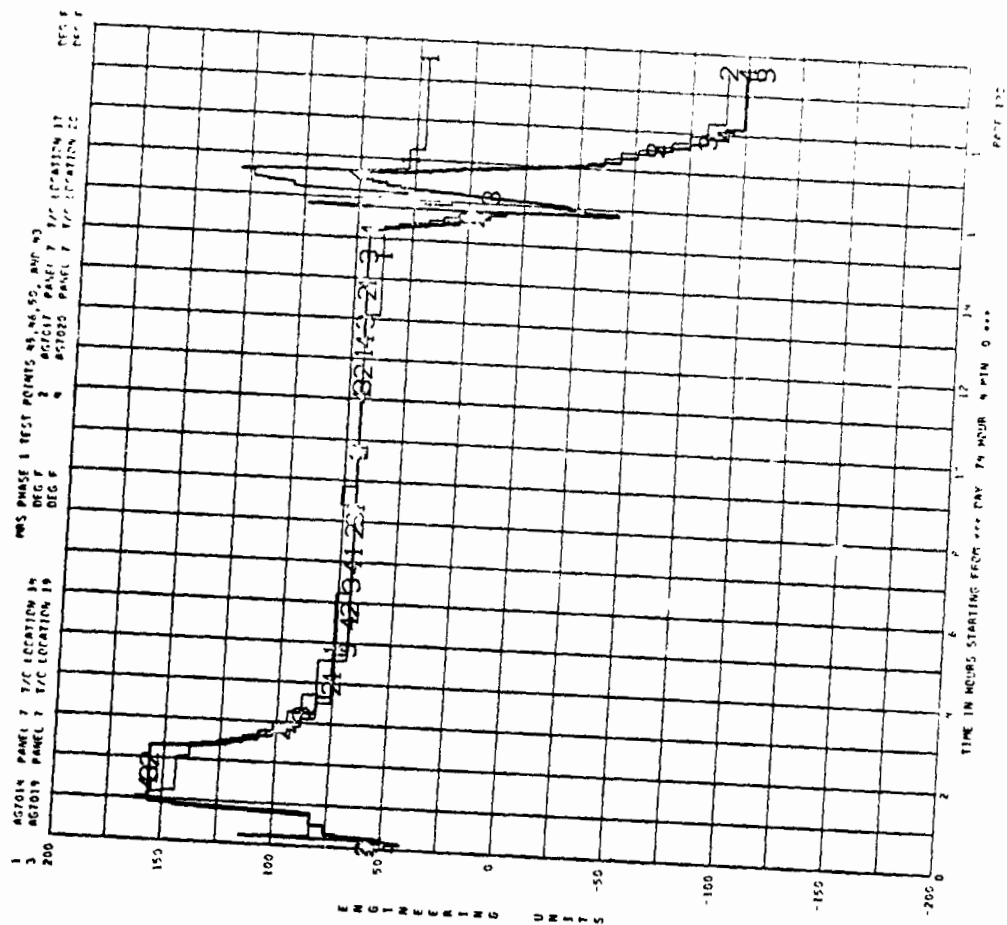
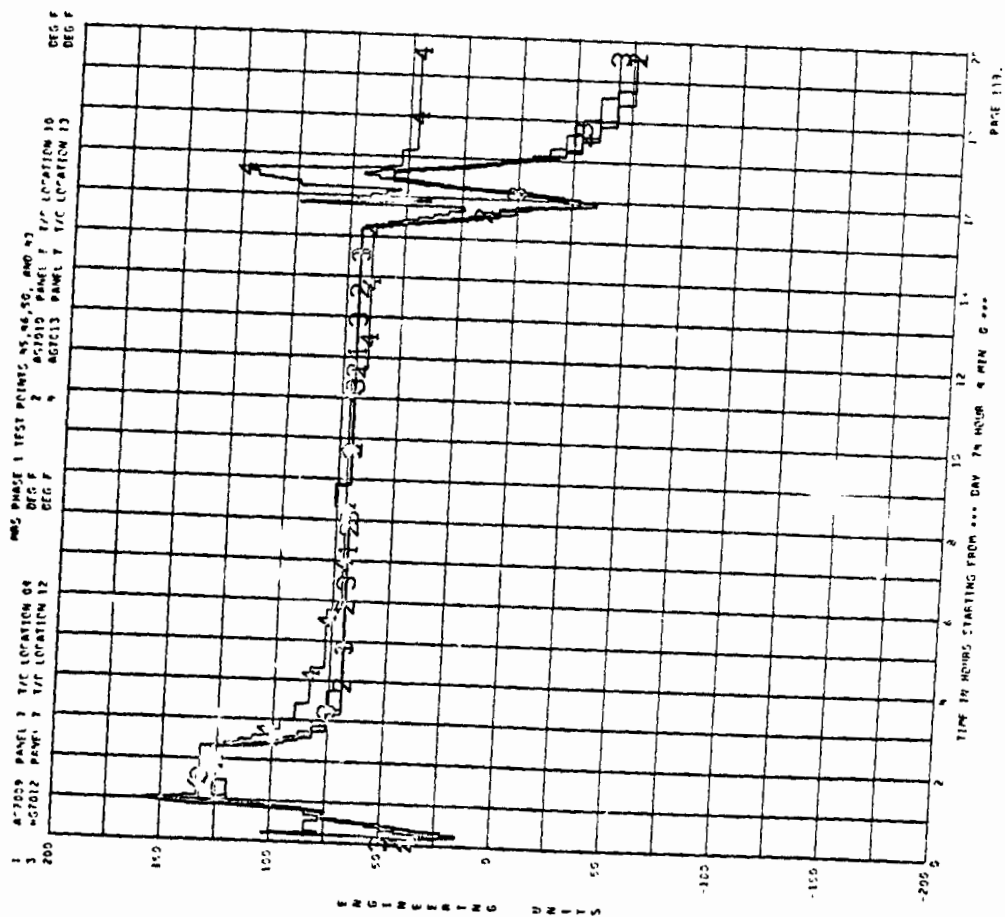


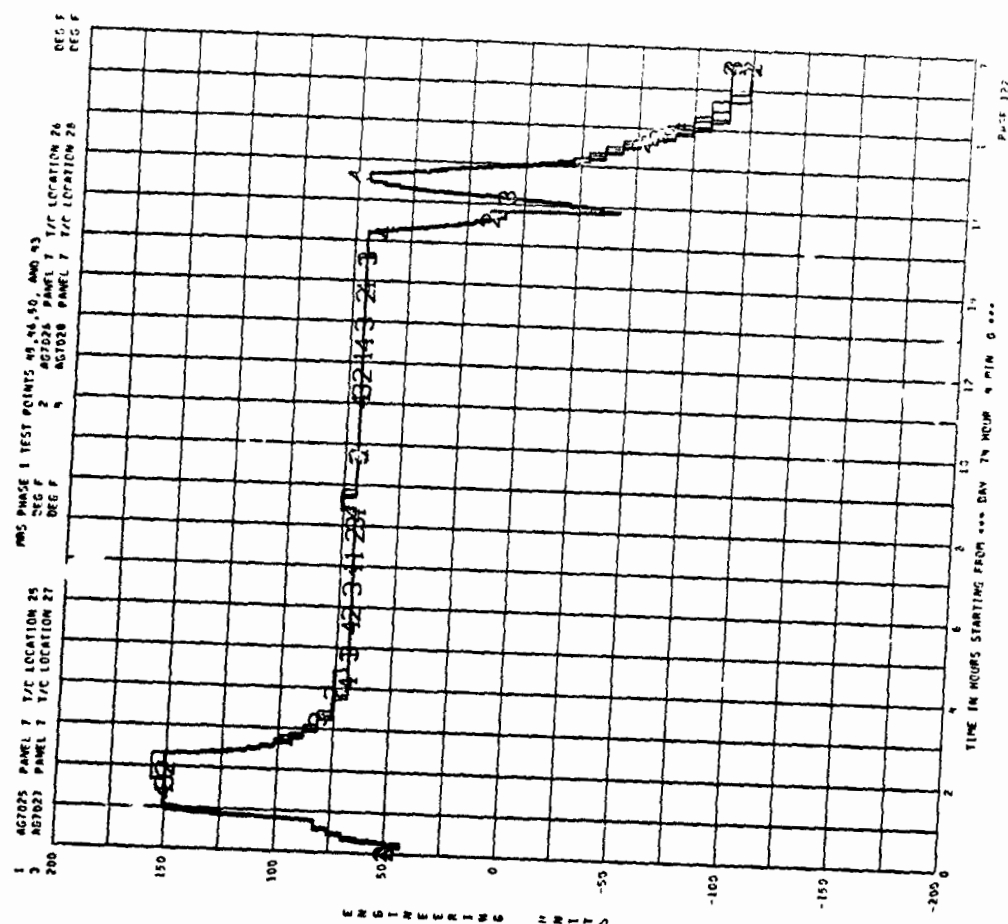
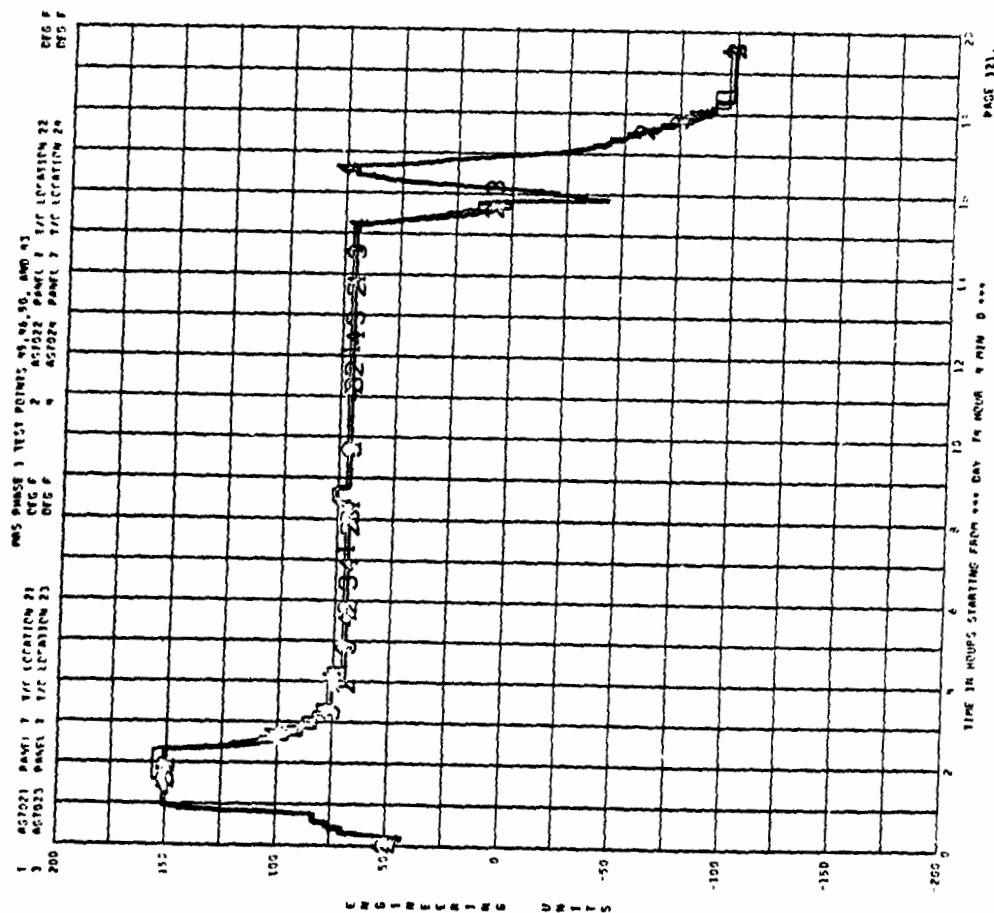


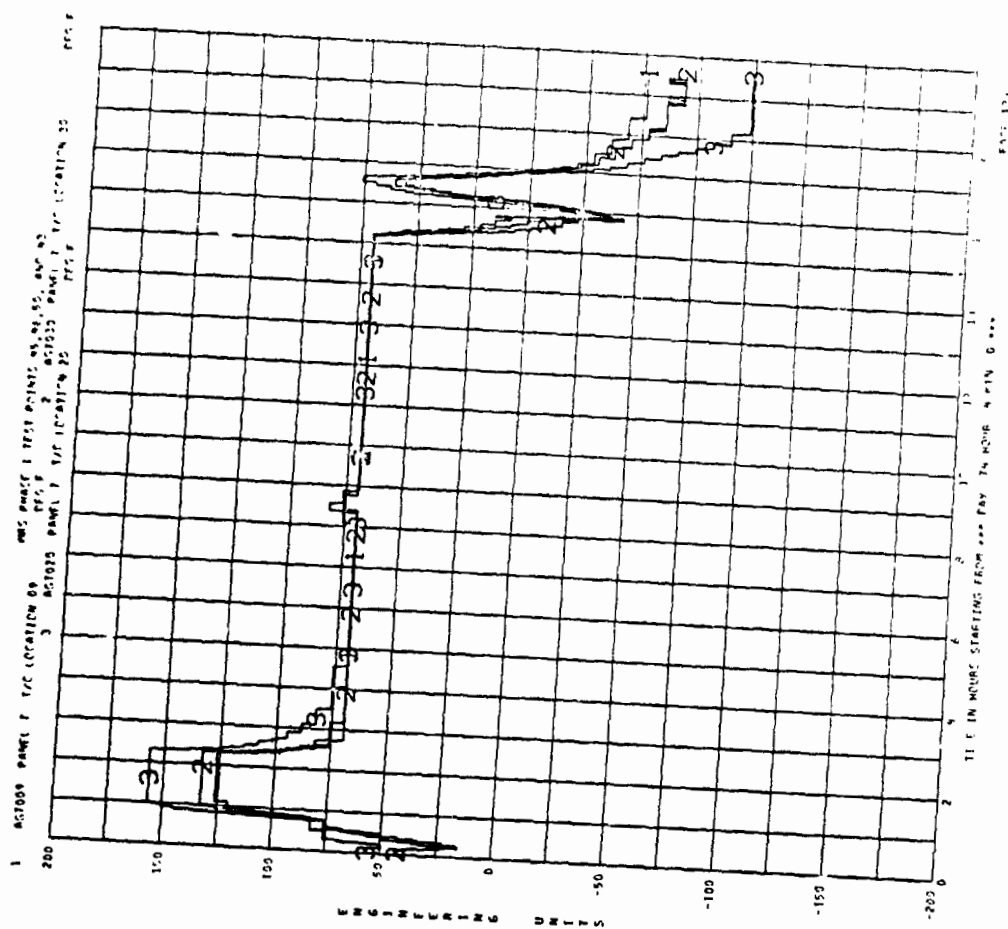
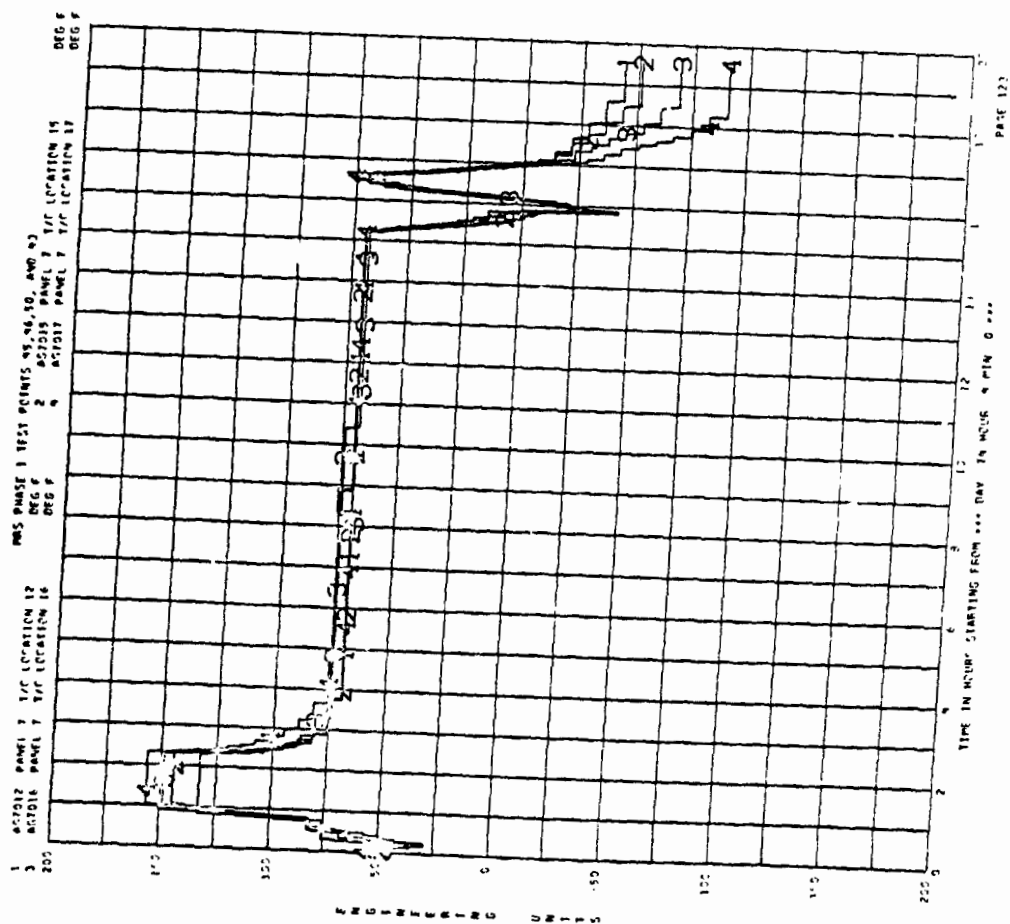
1 AF603N PANEL 6 T/C LOCATION 34
 2 AF603N PANEL 6 T/C LOCATION 35
 3 AF603N PANEL 6 T/C LOCATION 36

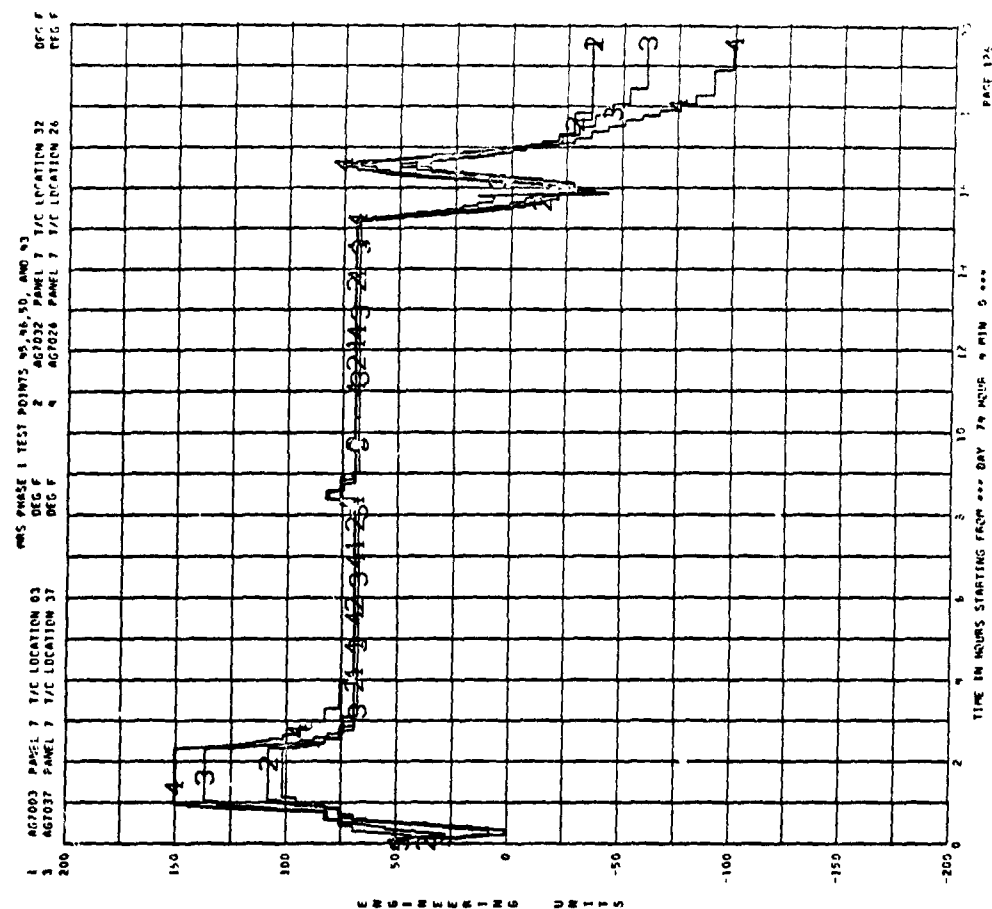
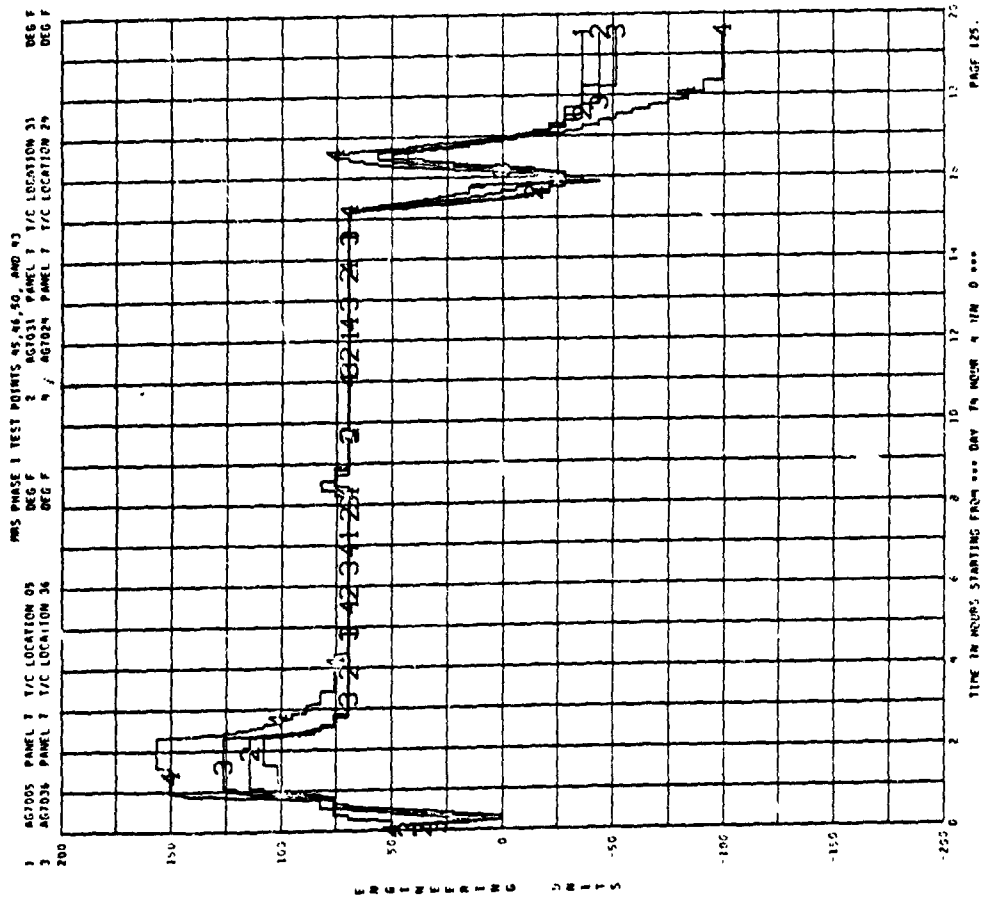


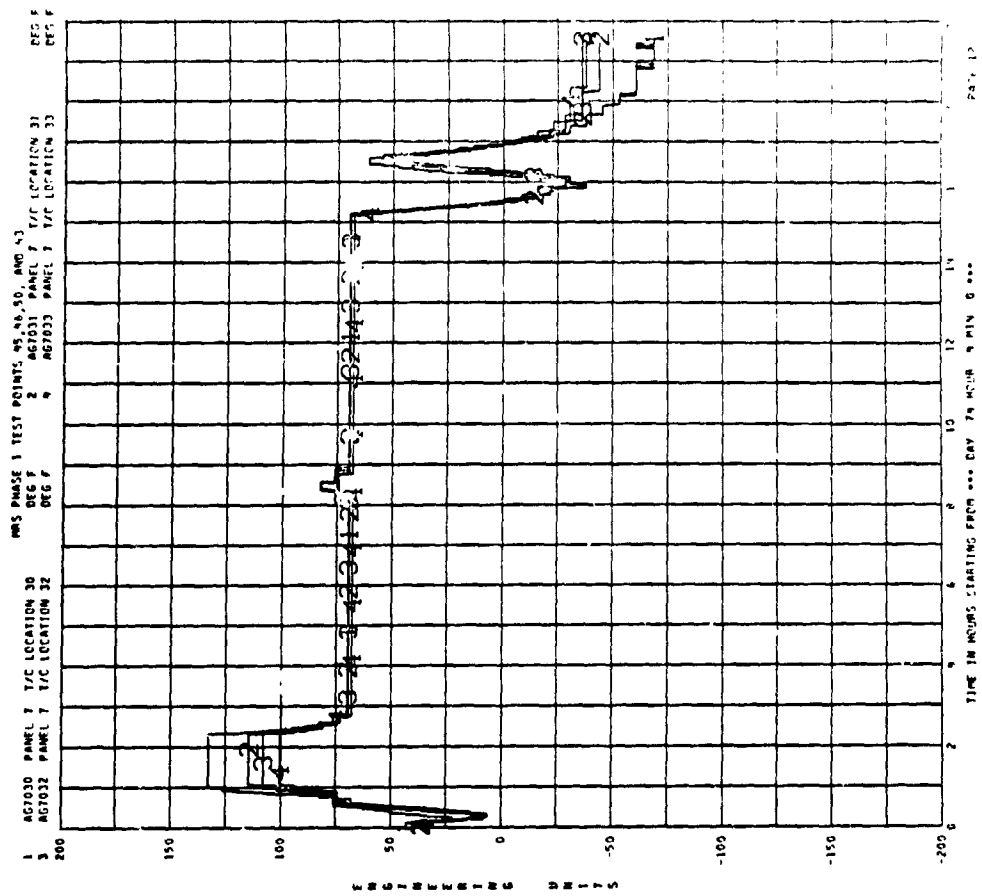
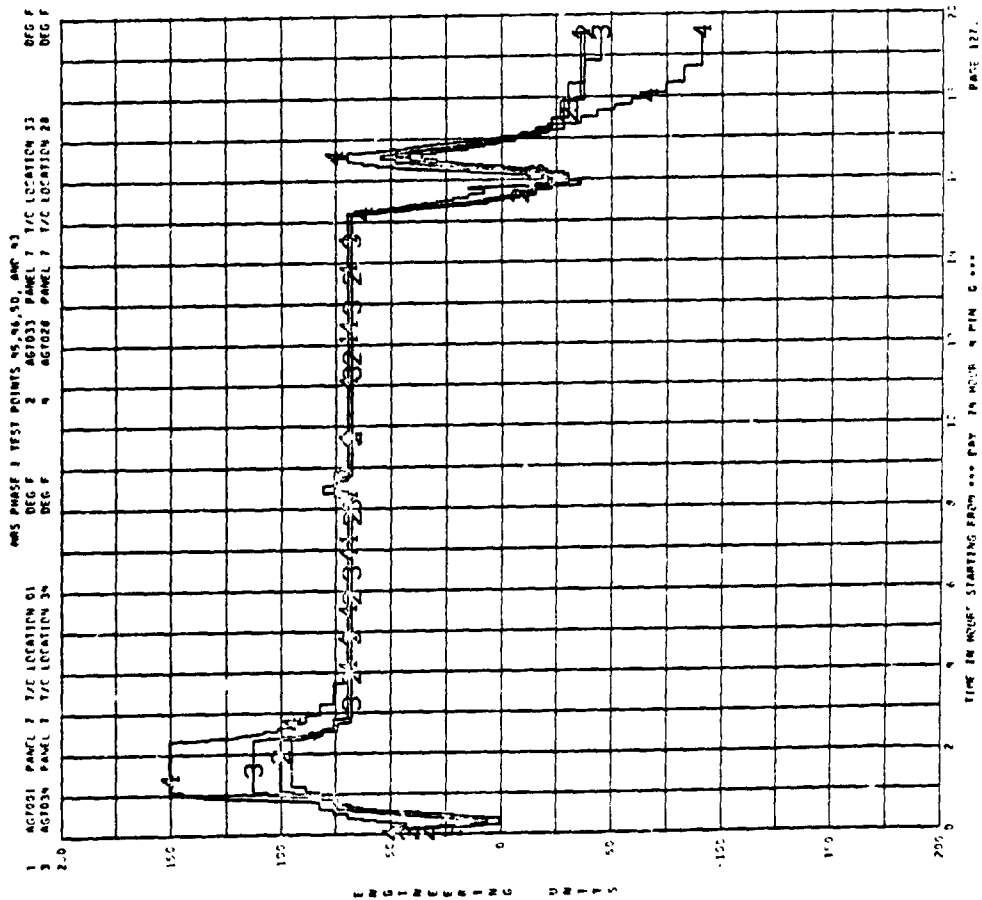


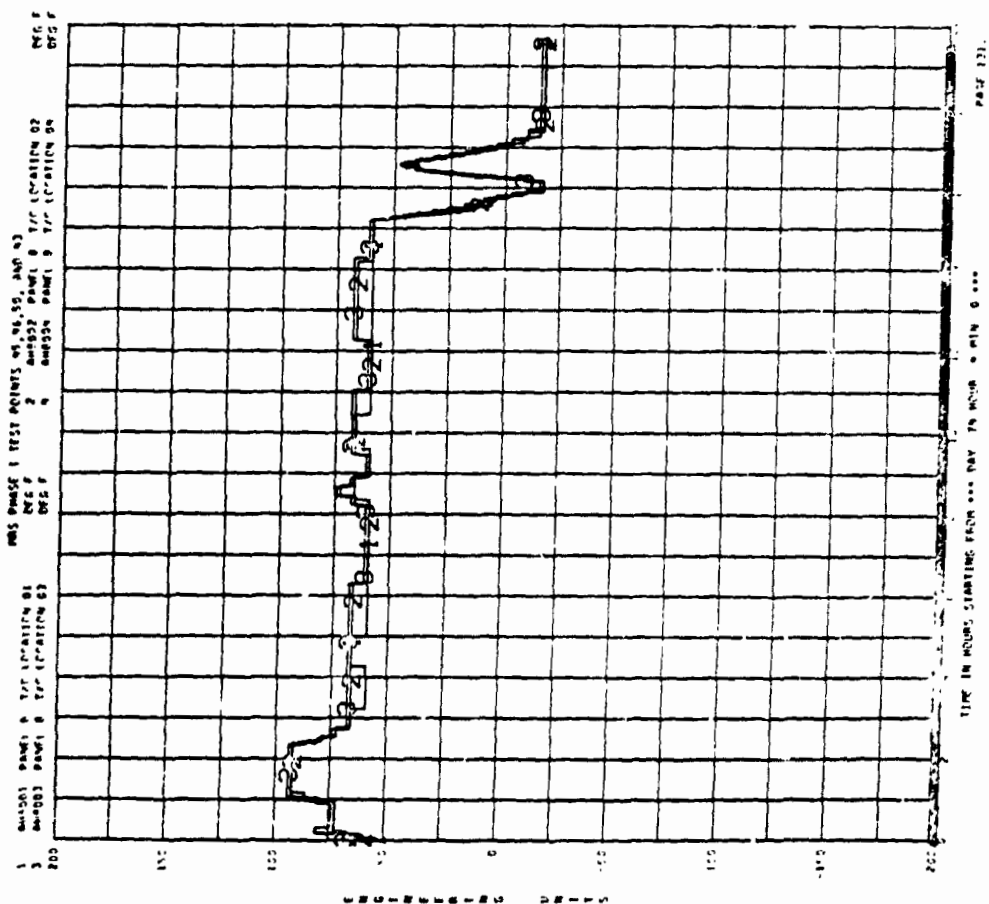




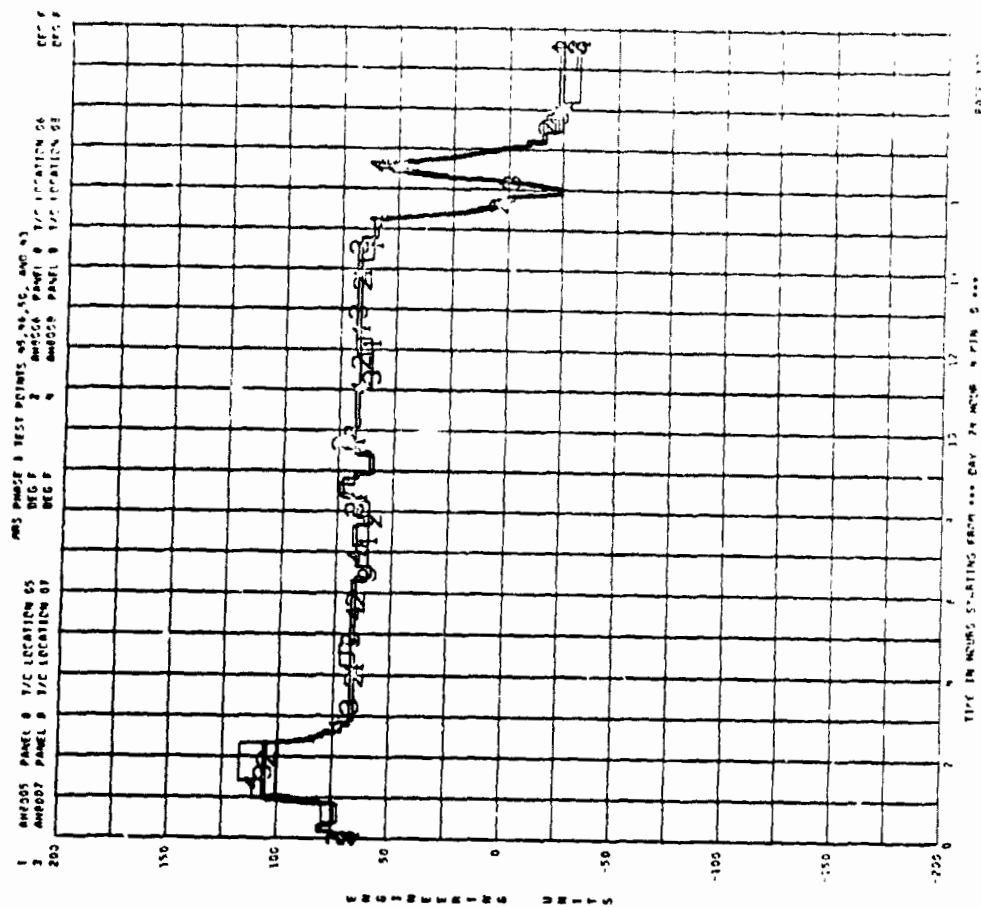








PAGE 121



PAGE 122

